MEDUMAT Basic

Ventilator **WM 22600**

MEDUMAT Basic p

Ventilator **WM 22650**

Servicing and repair instructions

WEINMANN
medical technology

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Introduction

For decades, Weinmann has developed, manufactured and distributed equipment for emergency medicine, oxygen therapy and inhalation therapy.

In 1972, Weinmann introduced the first MEDUMAT emergency ventilator to the market.

MEDUMAT emergency ventilators are automatic resuscitators. They are used for controlled respiration in emergency medicine, e.g. in the event of acute ventilatory disorders, and for secondary obstructions.

The new generation of equipment, which was especially developed to meet the requirements of users, offers users and patients an enhanced level of safety. An intelligent alarm system monitors the patient's breathing and notifies the user of any malfunctions. Hence, this technology offers even greater safety and reliability during respiration.

The aim of these service and repair instructions is to familiarise you, as a **knowledgeable expert,** with the MEDUMAT in terms of function, technology and repairs. In conjunction with the training you have already received from Weinmann, you are now a "trained, qualified expert" and are able to instruct your clients correctly, rectify faults yourself, and perform the functional checks described in the instructions for use, as well as conduct any repairs which may be necessary, as outlined in these service and repair instructions.

In the event of a guarantee claim, MEDUMAT should be returned to Weinmann.

To enable us to process any guarantee or goodwill claims, please return the consumer's proof of purchase (invoice) together with the device.

Repairs and maintenance work must be carried out only by Weinmann or by knowledgeable experts.

You are responsible for all repairs performed by yourself and the warranty thereof!

Only original Weinmann spare parts should be used for repair purposes.

Please remember:
Your customer trusts you and relies on your expertise, just as you rely on Weinmann.

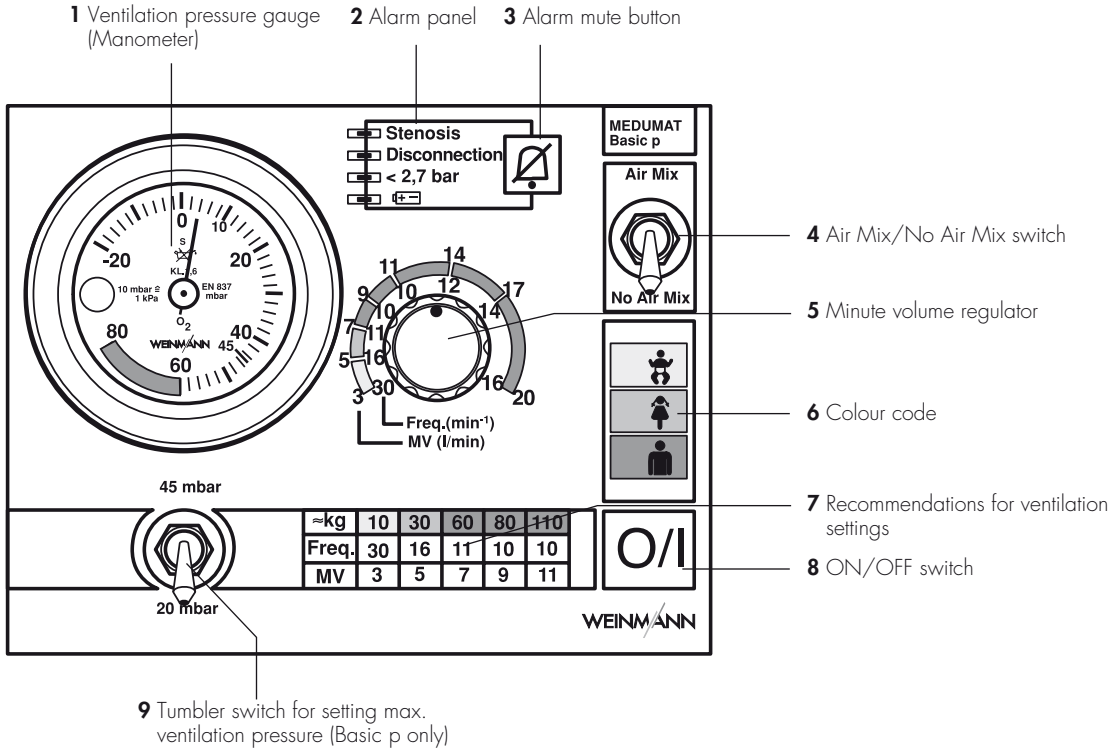
Note:

The following information can be found in the description and operating instructions for MEDUMAT:

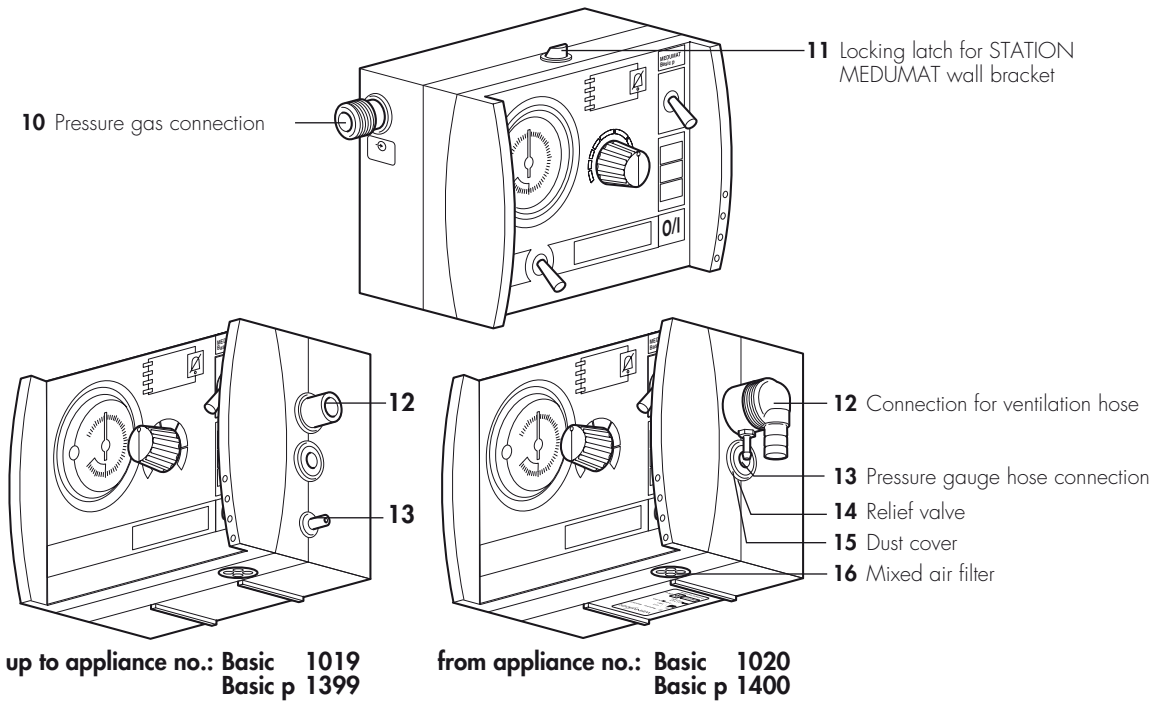
- Safety instructions
- Mounting with the wall bracket STATION MEDUMAT,
  Mounting of accessories
- Operation
- Hygienic preparation
- Functional check

1. Overview

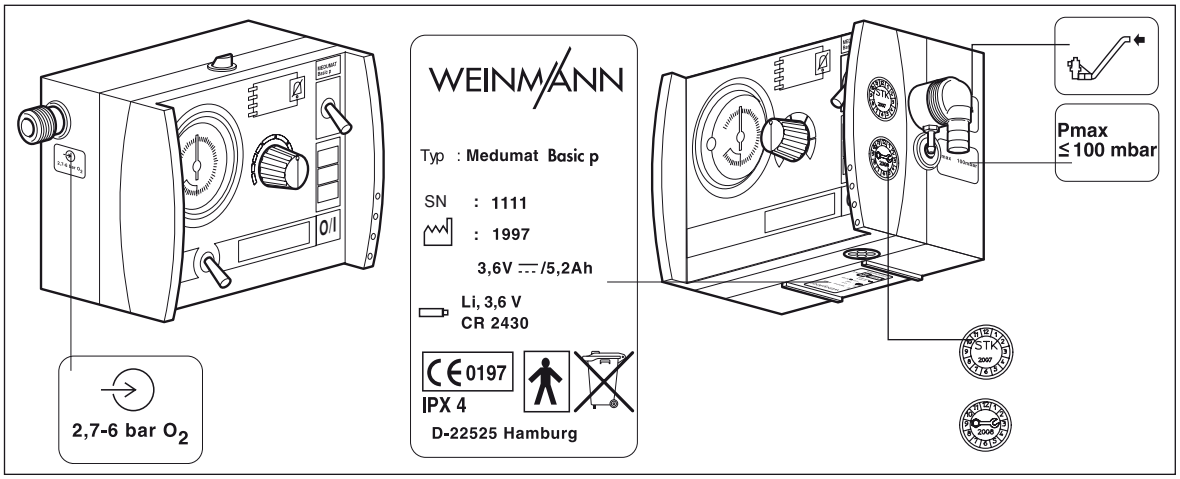
Control panel MEDUMAT Basic, Basic p



MEDUMAT Basic, Basic p connections



1.1 Symbols used on the ventilator



2,7-6 bar O_2	Inlet 2,7 - 6 bar O_2.
MEDUMAT Basic / Basic p device information plate	
SN	Serial number of device
	Year of manufacture
	Do not dispose of device in domestic waste.
Safety check and servicing label	
	Servicing label: indicates when the next service is due.
	Safety check label (in Germany only): marks when the next safety check as per §6 of the German law relating to users of medical devices is required.

2. Description of ventilator

2.1 Uses

MEDUMAT Basic / Basic p is an automatic (short-term) ventilator.

You can use MEDUMAT Basic / Basic p:

- to revive patients at the site of an emergency
- on a longer term basis in more protracted emergencies, e.g. fires.

You can use MEDUMAT Basic / Basic p whilst transporting patients:

- between the various rooms and departments of a hospital;
- between the hospital and other premises;
- in emergencies;
- when transport over a considerable distance is planned.

MEDUMAT Basic / Basic p:

- is designed to provide controlled ventilation to persons of 10 kg body weight or more;
- is used to treat respiratory arrest;
- can be preset to parameters that ensure evenly balanced ventilation provided that the selected maximum ventilation pressure P_{max} is not exceeded.
- can be supplied with additional modules for aspiration and oxygen inhalation. (N.B. MEDUMAT Basic / Basic p cannot be used as a ventilator simultaneously with these modules)

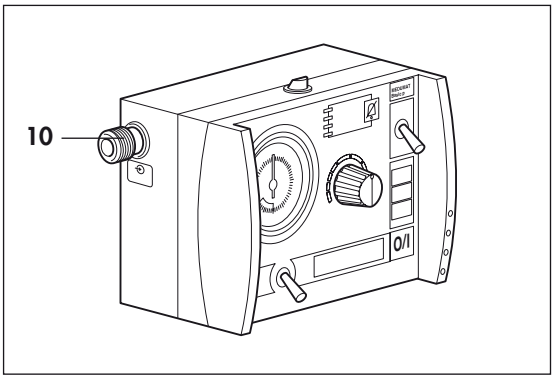
2.2 Ventilation function

MEDUMAT Basic / Basic p operates within a pressure range of 2.7 to 6 bar and at a flow rate of not less than 70 l/min O_2. It has a built-in power pack.

The gas used for ventilation is highly compressed medical oxygen, which is reduced to the required operating pressure by a two-stage external pressure reducer. The oxygen supply is fed in at input valve **10**.

The continuously adjustable ventilation settings and the inspiration/expiration ratio of1:1.67 are regulated internally by electronic control processes.

The gas for inspiration flows along the hose and through the patient valve and either the mask or the tracheal tube into the patient's airways. The patient valve is fitted with a lip membrane that enables expired gas to be conducted away through the expiration tube.

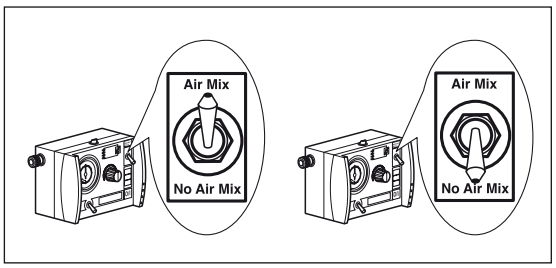


At the normal **Air Mix** setting, atmospheric air is admixed to give an O_2-concentration of between 55% and 85% at 10 mbar ventilation pressure (see "9.2 O2 content when using Air Mix" on page 55).

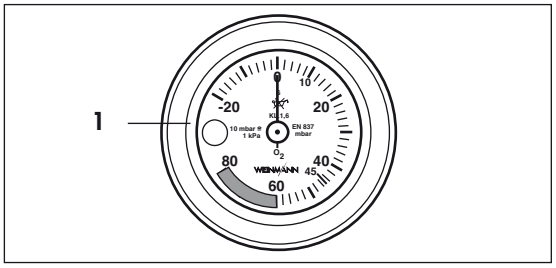
In certain indications and in cases where the surrounding atmosphere is contaminated, you can switch to **No Air Mix** and ventilate with pure oxygen.

The injector unit is switched off when switching from **Air Mix** to **No Air Mix**. This increases minute volume which can result in the set pressure limit being **exceeded** and a stenosis alarm (Stenosis) being triggered. In this case, set minute volume correspondingly **lower**.

In the opposite instance, in other words when switching from **No Air Mix** to **Air Mix**, the injector unit is switched on. This reduces minute volume which can lead to the set pressure limit being **undershot**. In this case, set minute volume correspondingly **higher**.



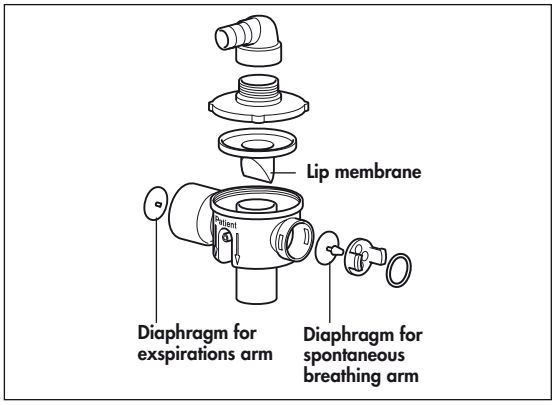
You can check the course of the ventilation on pressure gauge **1**.



2.3 Patient valve

The gas for inspiration is channelled into the patient's airways through the patient valve.

This valve is designed to enable spontaneous breathing in case of equipment failure.



3. Final Check

After any repair and maintenance work, the device must be subjected to the following final check in accordance with the Test Instructions WM 22671 and Test Record.

Note:
For a final check on the MEDUMAT Basic / Basic p you must connect the respiration tube and the patient valve.

If the final check reveals faults or deviations from the specified values, you must not use the MEDUMAT Basic / Basic p.

We recommend you to keep the following parts in stock:

- Replacement seals for device connections;
- Replacement dust filter;
- Lip diaphragm for patient valve;
- Diaphragm for spontaneous breathing leg;
- Diaphragm for expiration leg;
- O–Ring 1145/118.

3.1 Test resources required

- Flowmeter, PF 300 (imtmedical), RT 200 (Timeter), EKU VIP (EKU Elektronik) or comparable testing device
- Functional check test set WM 15335
- Adjustable orifice, e.g. ball valve, internal diameter ≥ 10 mm
- Oxygen concentration measuring device, 0 – 100 % ± 1 %, e.g. Type Oxycontrol WM 13550
- Set: hose with injector WM 15359
- Pressure gauge 0 - 13 bar, class 1.6
- Pressure gauge 0 - 160 mbar, class 1.6
- Set, supply test Medumat / Modules WM 15440

Default settings for flow meter PF300

Settings	Values
Default settings: – Type of gas – Gas standardization	 Air/O_2 auto STP
Trigger settings: – Type of ventilation – Source – Start – End – Delay – Base flow rate	 Adult Internal HF Flow rate ≥ 3.0 l/min Flow rate ≤ 3,0 l/min 60 ms disabled
Units and measured values: – P high – P diff – Rate – Vti – O_2	 bar mbar 1/min or b/min ml %

If you have a comparable testing device, contact WEINMANN's Technical Support department to have the setting parameters calibrated.

3.2 Preparations for final check

1. Connect MEDUMAT Basic / Basic p to pressure supply 4.5 – 6 bar of cylinder system.
2. Connect respiration tube and pressure measurement tube to MEDUMAT Basic / Basic p.
3. Set MEDUMAT Basic / Basic p with switch in position **No Air Mix** to Freq. = 30 min^{-1}, MV = 3 l/min and P_{max} = 45 mbar.
4. Start check.

3.3 Entering device data

- Enter the device number and date of manufacture in the Test Record.

3.4 Testing for leaks and checking pressure reading

3.4.1 Testing for leaks on the inlet side

- With device switched off, apply pressure of 6 bar to inlet side and shut off outlet pressure.
- Set lever to **No Air Mix.**

  Requirement: The pressure drop must be less than 0.2 bar/min.
- Set lever to **Air Mix.**

  Requirement: The pressure drop must be less than 0.2 bar/min.

3.4.2 Testing for leaks in pressure measurement segment

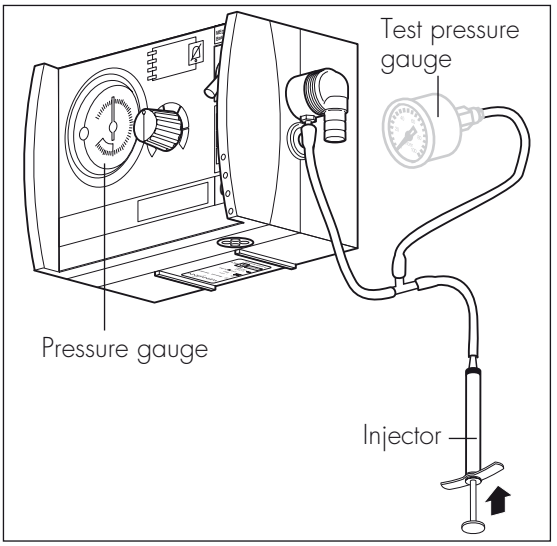
- Apply pressure of 60 mbar to pressure measurement segment of MEDUMAT Basic / Basic p.
- During the measurement, a traction force of approx. 3 N must be applied manually to the elbow outlet.

  Requirement: The pressure drop must be less than 2 mbar/min.

3.4.3 Checking pressure reading

1. Attach T-connector with injector (WM 15359) to pressure measurement connection **13**.
2. Connect test pressure gauge 0 - 100 mbar or Timeter to free end of T-connector (pressure gauge/volumetric flowmeter not supplied with device).
3. Use injector to create a pressure of 55 mbar as shown on the test pressure gauge.

Requirement: Respiration pressure reading must not deviate from set value by more than ≤ 1.5 mbar.



3.5 Device self-test after switching on

1. Apply approx. 4.5 bar to the inlet.
2. Switch on MEDUMAT Basic / Basic p at pushbutton **8** O/I.

   Requirement: The self-test is activated: all 4 LEDs light up together and a brief signal tone sounds.

3.6 Functional check on alarms

3.6.1 Stenosis alarm check up to appliance no.: Basic 1019; Basic p 1399

- Set MEDUMAT Basic / Basic p to the **Air Mix** setting at f = 30/min, MV = 3 l/min and p_{max} = 45 mbar. Close patient valve outlet.
  Note: Over-response of needle is normal.

  Requirement: The stenosis alarm must be activated after two respiration cycles.

- Set MEDUMAT Basic / Basic p to the **No Air Mix** setting at f = 30/min, MV = 3 l/min and p_{max} = 45 mbar. Close patient valve outlet.
  Note: Over-response of needle is normal.

  Requirement: The stenosis alarm must be activated after two respiration cycles.

3.6.2 Stenosis alarm check from appliance no.: Basic 1020; Basic p 1400

- Set MEDUMAT Basic / Basic p to the **Air Mix** setting at f = 30/min, MV = 3 l/min and p_{max} = 45 mbar. Close patient valve outlet.
  Note: Over-response of needle is normal.

  MEDUMAT Basic / Basic p briefly switches to expiration if the maximum ventilation pressure is exceeded, but then tries to continue inspiration in the same inspiration phase.

  If the maximum ventilation pressure is exceeded for a second time during the same inspiration phase, the unit finally switches to expiration and vents the patient tube system completely. The next inspiration begins with the following ventilation stroke according to the frequency selected.

  Requirement: The stenosis alarm must be activated after two respiration cycles.

- Set MEDUMAT Basic / Basic p to the **No Air Mix** setting at f = 30/min, MV = 3 l/min and p_{max} = 45 mbar. Close patient valve outlet.
  Note: Over-response of needle is normal.

  Requirement: The stenosis alarm must be activated after two respiration cycles.

3.6.3 Test alarm mute button

- Immediately after first alarm tone sounds, press button **3** alarm acknowledgement.

  Requirement: The alarm tone must be suppressed immediately. The alarm sounds again after approx. 1 min (or immediately, if parameters are changed).

3.6.4 Disconnection alarm check

- Open patient valve outlet.

  Requirement: The disconnection alarm must be activated after two respiration cycles.

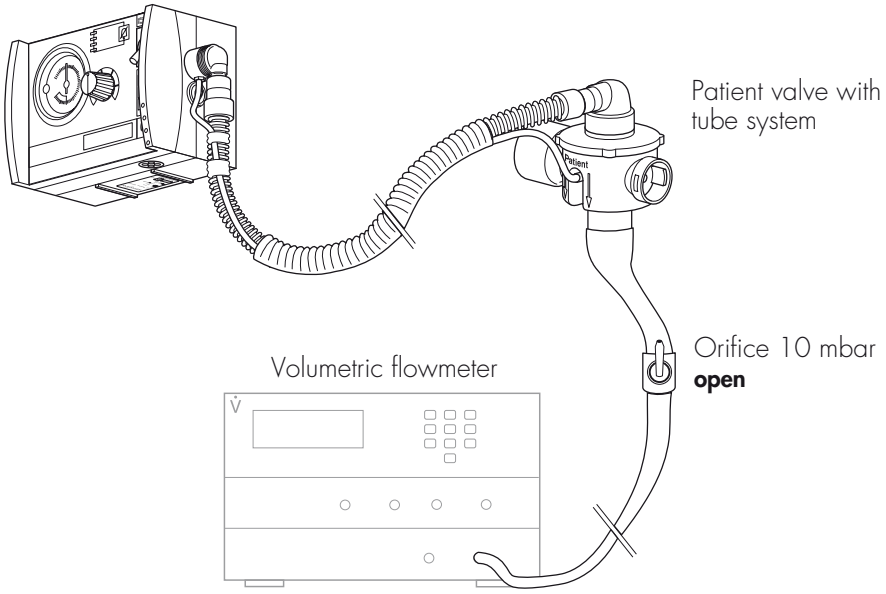
3.6.5 Pressure alarm check

- Shut off pressurised gas connection of MEDUMAT Basic / Basic p (2.7 - 6.0 bar).

  Requirement: The pressure alarm must be activated.

3.7 Functional check on frequency setting

Connect respiration tube to 10 mbar orifice and to volumetric flowmeter.



1. Run MEDUMAT Basic / Basic p in position **No Air Mix**, Freq. = 16 min^{-1} and MV = 20 l/min.
   Requirement: The measured frequency must be 16 ± 2 min^{-1}.
2. Run MEDUMAT Basic / Basic p in position **No Air Mix**, Freq. = 10 min^{-1} and MV = 11 l/min.
   Requirement: The measured frequency must be 10 ± 2 min^{-1} .
3. Run MEDUMAT Basic / Basic p in position **No Air Mix**, Freq. = 30 min^{-1} and MV = 3 l/min.
   Requirement: The measured frequency must be 30 ± 2 min^{-1} .

3.8 Functional check on tidal volume at 4.5 bar delivery pressure and 10 mbar counterpressure

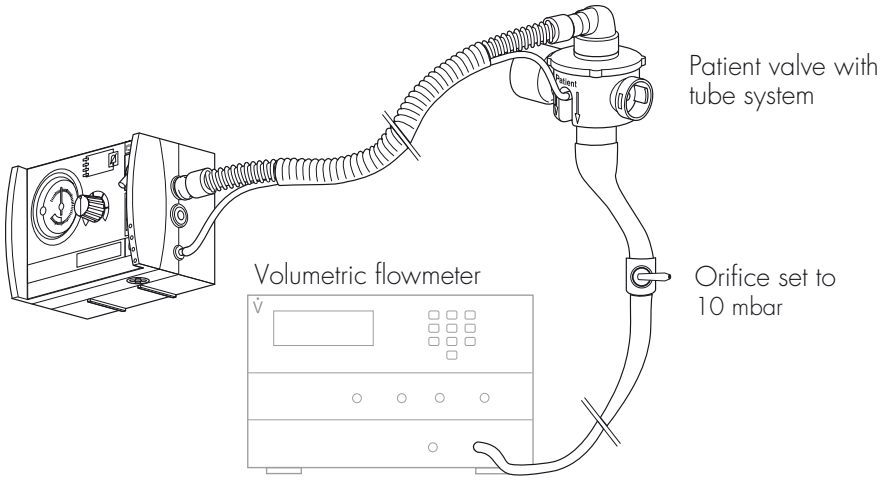
1. Run MEDUMAT Basic / Basic p in position **No Air Mix**, Freq. = 16 min^{-1} and MV = 20 l/min.
   Requirement: Tidal volume must be 1250 ± 190 ml.
   Switch MEDUMAT Basic / Basic p to position **Air Mix**.
   Requirement: Tidal volume must be 1250 ± 190 ml.
2. Run MEDUMAT Basic / Basic p in position **No Air Mix**, Freq. = 10 min^{-1} and MV = 11 l/min.
   Requirement: Tidal volume must be 1100 ± 170 ml.
   Switch MEDUMAT Basic / Basic p to position **Air Mix**.
   Requirement: Tidal volume must be 1100 ± 170 ml.

3. Run MEDUMAT Basic / Basic p in position **No Air Mix**, Freq. = 30 min^{-1} and MV = 3 l/min.

   Requirement: Tidal volume must be 100 ± 20 ml.

   Switch MEDUMAT Basic / Basic p to position **Air Mix**.

   Requirement: Tidal volume must be 100 ± 20 ml.

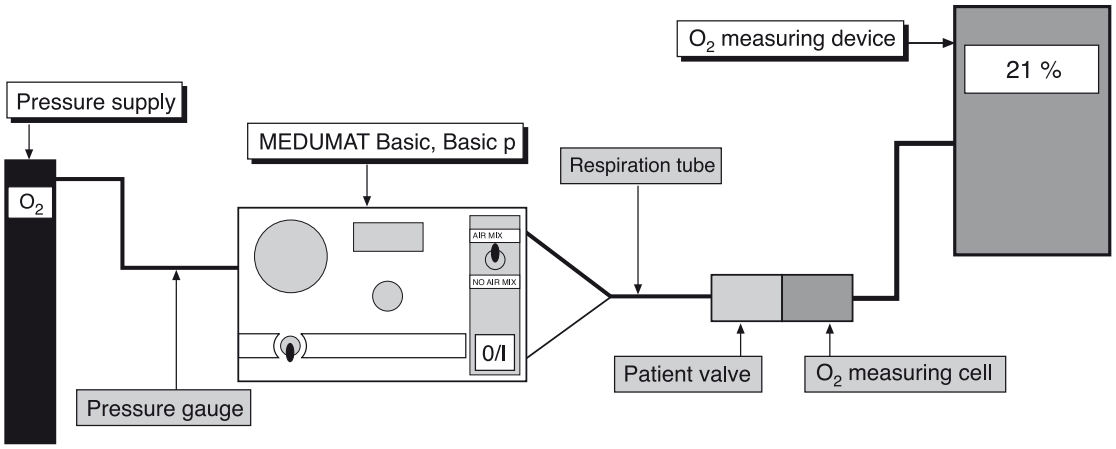


3.9 Checking oxygen concentration

1. Run MEDUMAT Basic / Basic p in position Freq. = 10 min^{-1} and MV = 11 l/min with 100 % O_2.
2. Check O_2 concentration in position **No Air Mix**.

   Requirement: The O_2 concentration must be greater than 98 %.
3. Check O_2 concentration in position **Air Mix**.

   Requirement: The O_2 concentration must lie between 50 % and 65 %.



3.10 Functional check on pressure limit

1. Connect respiration tube to test bag.
2. Set MEDUMAT Basic / Basic p to **No Air Mix**, Freq. = 11 min^{-1} and MV = 7 l/min.
3. Applies to **MEDUMAT Basic / Basic p Basic p** only
   Set pressure limit to 20 mbar.

   Requirement: The pressure limit must respond at 20 ± 5 mbar and trigger the stenosis alarm.
4. Applies to **MEDUMAT Basic / Basic p Basic** and **MEDUMAT Basic / Basic p Basic p**
   Set pressure limit to 45 mbar.

   Requirement: The pressure limit must respond at 45 ± 5 mbar and trigger the stenosis alarm.

3.11 Functional check on exhaust valve without patient valve

1. Run MEDUMAT Basic / Basic p in position f = 10 min^{-1} and MV = 11 l/min.
2. Connect patient valve to device outlet with expiration outlet closed, without lip diaphragm and with test bag.

   Requirement: The test bag is completely inflated in one inspiration stroke. The respiration device can then be heard to exhaust.

3.12 Check the breath volume

See "Check the breath volume" in the description and operating instructions for MEDUMAT.

3.13 Checking equipment and accessories (system components)

- Respiration tube with patient valve undamaged and in working order
- Functional check test set in working order
- Pressure reducer in working order
- O_2 cylinder within test deadline; valve in working order
- Portable system complete and in working order
- Medical products book present
- Operating instructions present

3.14 Checking external condition

- Check external condition of device.

  Requirement: No mechanical damage to housing.

  Device labels with operating information are legible.

  Sealing sleeves are properly seated.

  Pressure gauge zero reading is correct.

  Connecting thread G3/8 is undamaged and functions smoothly.

  All rotary knobs are self-locking against inadvertent readjustment.

3.15 Documentation

- Document points 4. to 13. in the Test Record, along with test date and tester number.

4. Servicing

N.B.
Always remember to carry out a technical safety check of the ventilator after every repair.

MEDUMAT Basic / Basic p must be serviced regularly.

We recommend having all maintenance work, servicing and repairs carried out either by the manufacturer Weinmann or by a qualified agent expressly authorised by that company.

4.1 Intervals and Scope

Every 2 years:

Every 2 years, you must subject the device (including patient valve and tube system) to a **technical safety check and maintenance.**

The servicing and inspection may also be carried out by the manufacturer Weinmann.

The following points should be observed:

- Check that the equipment is complete
- Visual check for:
  - physical or mechanical damage
  - correct markings on controls
  - damage to all external hoses
- Replacement of worn components/ compulsory change parts (see "7.2 Maintenance set" on page 49);
- Check of system components: portable system, oxygen supply fittings, secretion suction system, hose connections etc.
- Check test bag.
- Repeat testing of aluminium oxygen bottles WM 1821 and WM 3621 by the Technical Testing Association. The specified testing date is stamped on the shoulder of the bottle.
- **Final check in accordance with Test Instructions/ Test Report STK WM 22671 (see „3. Final Check" on page 8 and see "11. Repair and inspection log" on page 57).**

Every 4 years:

- Servicing of the fittings in the oxygen supply system (e.g. pressure reducer) either by the manufacturer or by a qualified agent expressly authorised by him.

Every 10 years:

- Repeat testing of the conventional steel or aluminium oxygen bottles by the Technical Testing Association. The specified testing date is stamped on the shoulder of the bottle.

4.2 Batteries and fuses

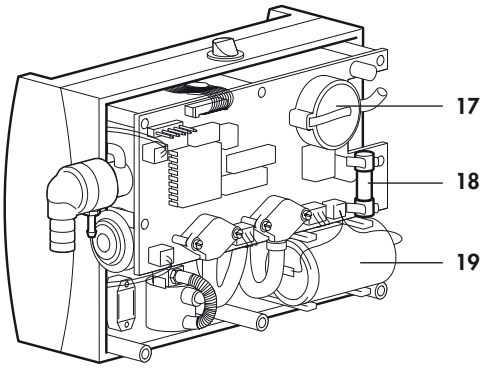
MEDUMAT Basic / Basic p is fitted with two batteries which must always be changed together:

A button cell CR2430 **17** supplies the electronics with auxiliary power if the capacity of the main battery **19** is exhausted. This means that an alarm can still be activated in the event of sudden failure of the main battery. The device switches to expiration.

As a general rule, the capacities of the batteries are designed in such a way that under normal usage conditions, they do not need to be changed during the 2-year servicing intervals. Within the context of the prescribed 2-year servicing, the batteries are replaced completely.

We recommend that the batteries be changed only by the manufacturer Weinmann or by authorised specialists explicity authorised by them, since special precautions must be taken to protect the electronics (see "6.6 Changing the batteries" on page 23)).

For information on replacing the fuse, see Section „6.7 Replacing the fuse" on page 24.



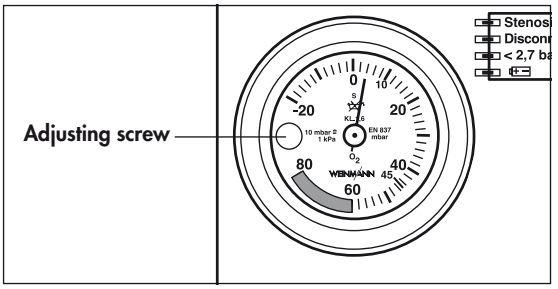
17:Button cell for auxiliary power
18:Fuse to prevent internal short-circuiting
19:Lithium battery 3.6 V for main power to MEDUMAT Basic / Basic p

4.3 Adjusting the pressure gauge

In the idle state, with MEDUMAT Basic / Basic p deactivated and the oxygen cylinder closed, the needle of the pressure gauge must point precisely to "**0**".

To adjust the needle, proceed as follows:

1. Carefully lever out the plastic cover of the adjusting screw.
2. Adjust the needle with the adjusting screw using a small screwdriver.
3. Re-insert the plastic cover.



4.4 Storage

If you are not intending to use MEDUMAT Basic / Basic p for a long period, we recommend the following storage precautions:

1. Clean and disinfect the ventilator (see "5. Hygienic preparation" of the description and operating instructions for MEDUMAT).
2. Store MEDUMAT Basic / Basic p in a dry place.

Important note!
Remember that the ventilator still requires servicing at the stipulated intervals even when in storage, otherwise it **cannot** be used when removed from storage.

4.5 Disposal

Do not dispose of the unit with domestic waste. For proper waste disposal of the equipment, please contact an approved and certified waste disposal site for electronic goods. Ask your Environmental Officer or town council for the address.

5. Troubleshooting

Defect	Cause of defect	Elimination
MEDUMAT Basic / Basic p Basic, Basic p cannot be switched on	Battery failure	Replace both batteries (chap. 6.6, page 23)
	Fuse is defective	Replace the fuse (chap. 6.7, page 24)
	Ribbon cable to front membrane faulty or not connected	Check plug-in connectors **X7** and cable (chap. 6.12, page 29); If necessary replace top of housing (chap. 6.18, page 39)
	On/Off switch faulty	If necessary replace top of housing (chap. 6.18, page 39)
	Circuit board faulty	Replace circuit board (chap. 6.12, page 29)
MEDUMAT Basic / Basic p Basic, Basic p cannot be switched off	User error	Keep switch **8** depressed for at least 2 seconds
	On/Off switch **8** faulty	If necessary replace top of housing (chap. 6.18, page 39)
MEDUMAT Basic / Basic p Basic, Basic p is functioning but without any displays	Pressure gauge hose on MEDUMAT Basic / Basic p Basic, Basic p or on patient valve slipped off	Check pressure gauge hose
	Kink in pressure gauge hose	
MV too high	Measured without 10 mbar counterpressure	Set to 10 mbar counterpressure
MEDUMAT Basic / Basic p Basic, Basic p: MV not correct	Measuring device not calibrated	Calibrate measuring device
	Spindles in pneumatic block out of adjustment	Replace pneumatic block (chap. 6.14, page 32) or replace pneumatic block with angled outlet (chap. 6.15, page 34)
MEDUMAT Basic / Basic p Basic only: MV not correct	Inlet pressure > 6 bar	Adjust system to below 6 bar
	Patient valve not in order	Check diaphragms and O-ring, replace if necessary (Chapter 6.8 of Operating Instructions)
	Adjustment knob incorrectly set	Reset adjustment knob (chap. 6.9, page 25)
	Air Mix/No Air Mix switch **4** faulty	Replace switch (chap. 6.17, page 38)
	Leak in pneumatic block	Replace pneumatic block (chap. 6.14, page 32) or replace pneumatic block with angled outlet (chap. 6.15, page 34)

Defect	Cause of defect	Elimination
Pressure limit (P_{max}) incorrect	Incorrect setting selected on device	Make correct setting (Chapter 6.5 of Operating Instructions)
	Pressure gauge not reading "0"	Adjust (chap. 4.3, page 16) or replace pressure gauge (chap. 6.13, page 31)
	Patient valve not in working order	Check diaphragms and O-ring, if necessary replace (Chapter 6.8 of Operating Instructions)
	Patient valve or test bag incorrectly connected	Check tube connections and bag
	MV not correct	See defect "MV not correct"
	Tube connections in device faulty	Check tubes and replace if necessary (chap. 6.14, page 32)
	Pressure sensor on circuit board faulty	Replace circuit board (chap. 6.12, page 29)
	Potentiometer for frequency faulty	Replace pneumatic block (chap. 6.14, page 32) or replace pneumatic block with angled outlet (chap. 6.15, page 34)
	Pressure measurement connection blocked	Replace (chap. 6.10, page 27)
	Two-way switch **9** 45 mbar/ 20 mbar faulty (for MEDUMAT Basic / Basic p Basic p)	Replace switch (chap. 6.17, page 38)
Alarms (visual and acoustic) faulty	LEDs do not light up	Replace top of housing (chap. 6.18, page 39)
	Incorrect indication (Stenosis/Disconnection)	Check settings, check tube connection to patient valve (Chapter 6.8 of Operating Instructions)
No alarm (visual + acoustic)	Circuit board faulty	Replace circuit board (chap. 6.12, page 29)
No acoustic alarm	Alarm acknowledgement pressed	Wait for 30 – 120 s
	Alarm sensor faulty	Replace alarm sensor (chap. 6.10, page 27)
No stenosis alarm	Valve unit membrane leaking	Check that valve membrane is properly seated
Alarm < 2,7 bar despite existence of pressure	Pressure sensor faulty	Replace circuit board (chap. 6.12, page 29)
	Tube connections in device faulty	Check tubes and replace if necessary (chap. 6.14, page 32)
Alarm	Battery failing	Replace both batteries (chap. 6.6, page 23)
Leak at pressure inlet	Elbow connector in device loose or faulty	Check (chap. 6.19, page 45)
Leaks in tubes in device		Check tubes and replace if necessary (chap. 6.14, page 32)

Defect	Cause of defect	Elimination
Leak in pressure sensor on circuit board		Replace circuit board (chap. 6.12, page 29)
Air Mix/No Air Mix switch **4** faulty		Replace switch (chap. 6.17, page 38)
Leak in pneumatic block		Replace circuit board (chap. 6.14, page 32)
O_2 concentration not correct	Measuring device not calibrated	Calibrate measuring device
	Incorrect measurement sequence	Check **No Air Mix** first, then **Air Mix**
	Air Mix/No Air Mix switch **4** faulty	Replace switch (chap. 6.17, page 38)
	Pneumatic block faulty	Replace pneumatic block (chap. 6.14, page 32) or replace pneumatic block with angled outlet (chap. 6.15, page 34)
Frequencies incorrect	Adjustment knob out of adjustment	Reset adjustment knob (chap. 6.9, page 25)
	Spindles (MV + frequency in MEDUMAT Basic / Basic p Basic) out of adjustment	Replace pneumatic block (chap. 6.14, page 32) or replace pneumatic block with angled outlet (chap. 6.15, page 34)
Test bag is not sufficiently inflated during functional check, disconnection alarm	Ventilation parameters wrongly selected	Correct ventilation parameters
	Patient valve not working properly	Check lip membrane
	Pressure gauge hose not fitted	Fit pressure gauge hose
No stenosis alarm when patient valve is closed during functional check, see "Functional check on tidal volume" (chap. 3.8, page 11)	Patient valve not working properly	Check lip membrane

6. Repair information and repair instructions

6.1 General

Repairs to MEDUMAT Basic / Basic p should be carried out only at an ESD workstation!

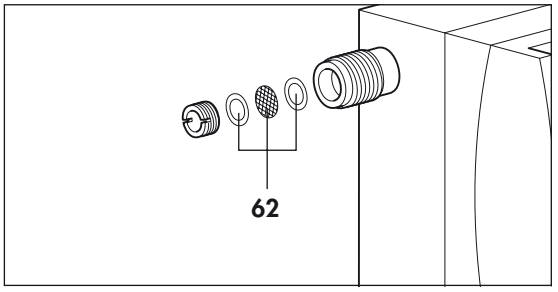
- **Please follow the safety instructions for MEDUMAT Basic / Basic p on page 6 of the description and operating instructions.**
- All handling of the device pre-supposes a precise knowledge of and compliance with the description and operating instructions and the service and repair instructions.
- Please carry out only the repairs described in these service and repair instructions. Otherwise, perfect functioning of the MEDUMAT Basic / Basic p cannot be guaranteed.
- Please ensure that your hands and workplace are clean when carrying out repairs.
- After each repair, please perform a functional check (see "3. Final Check" on page 8).
- When you replace components or individual parts, please use original Weinmann parts only.
- When ordering the housing base section **28**, please specify the device model, year of construction and device number.
- **Note:**
  The item numbers used in the following text match the item numbers in the spare parts list on page 47 and the overview on page 4.

6.2 Replacing the sieve in the compressed gas connection

Tools required:

- Slotted screwdriver,
- Tweezers.

1. Unscrew the slotted screw at the compressed gas connection **10**.
2. Using the tweezers, remove the sieve set **62**.
3. Carefully insert a new sieve set **62** into the compressed gas connection.
4. Screw the slotted screw back into the compressed gas connection.

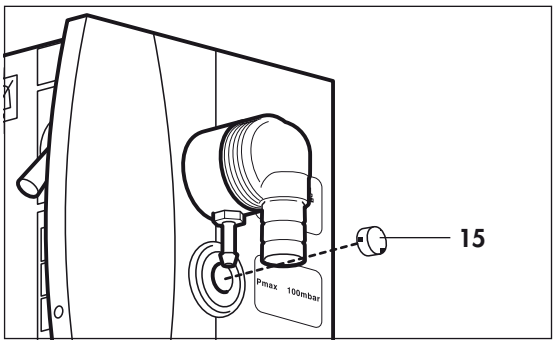


6.3 Changing the foam insert in the pressure relief valve outlet

Tools required:

- Tweezers.

1. Use tweezers to remove foam insert **15**.
2. Place a new foam insert **15** in the outlet.

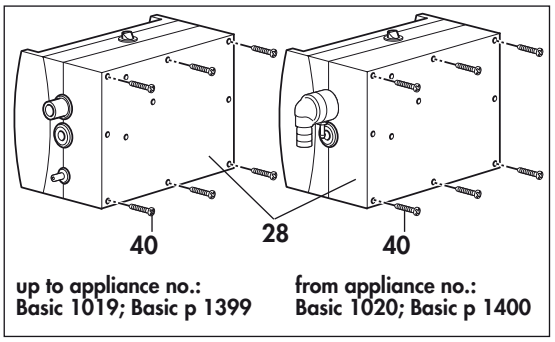


6.4 Opening the device

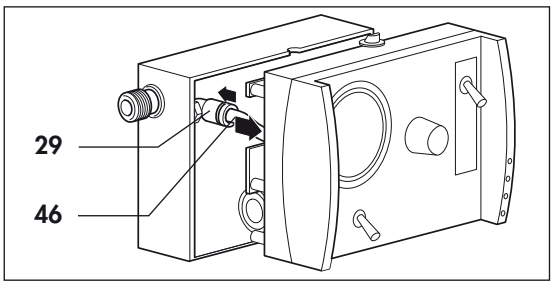
Tools required:

- Crosstip screwdriver, size 2.

1. Carefully place the device on a non-slip surface and unscrew the 6 screw **40** the rear panel of the device.
2. Pull off the housing base section **28** and fold it away.



3. Next, loosen the connecting tube **46** from the oxygen inlet by pushed back the sleeve on the angular bush **29** and pulling out the tube.



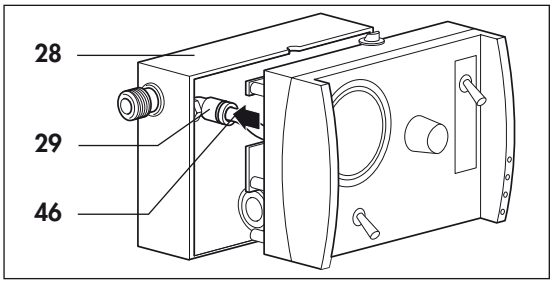
6.5 Closing the device

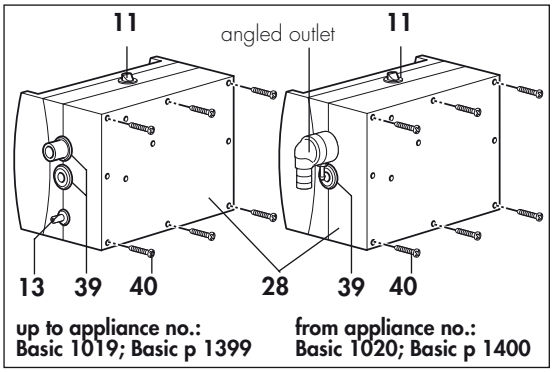
Tools required:

- Crosstip screwdriver, size 2.

1. Push the connecting hose **46** into the angular bush **29** as far as it will go.
2. Place the housing base section **28** onto the upper housing section.

   Take care to ensure that none of the lines are pinched and that the twistlock 11, the grommets 39 and the angled_outlet or_the pressure measurement connection 13 are correctly seated.
3. Next, secure the housing base section using the 6 screws **40**.
4. Perform a functional check (see "3. Final Check" on page 8).





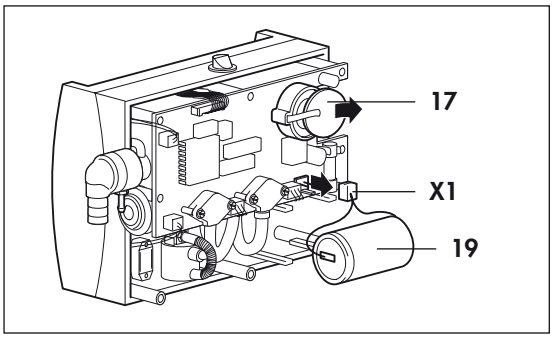
6.6 Changing the batteries

Tools required:

- Crosstip screwdriver, size 2.

1. Open the device (see "6.4 Opening the device" on page 22).
2. The main battery **19** can be removed by lifting the battery out of its holder and then pulling connector **X1** from the circuit board.
3. To remove the button cell **17**, gently lift up the plus contact and pull the button cell out sideways with your other hand.
4. Insert the new batteries by proceeding in the reverse order.

   Make sure that the wires for the main battery are not pinched and that the button cell is inserted with correct polarity!
5. Close the device (see "6.5 Closing the device" on page 23).
6. Perform a functional check (see "3. Final Check" on page 8).



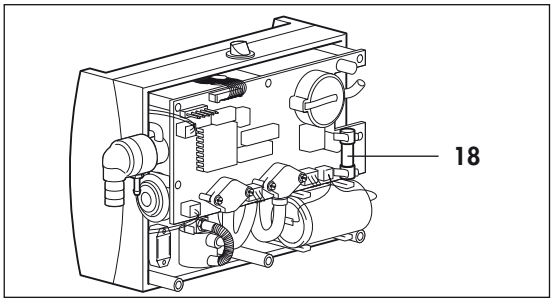
Remember that used batteries must not be disposed of with your domestic waste. Used batteries should be taken to a collection point in your area, or to a specialist dealer.

6.7 Replacing the fuse

Tools required:

- Crosstip screwdriver, size 2.

1. Open the device (see "6.4 Opening the device" on page 22).
2. Pull out the defective fuse **18** upwards.
3. Carefully press a new fuse **18** into the holder.
4. Close the device (see "6.5 Closing the device" on page 23).
5. Perform a functional check (see "3. Final Check" on page 8).

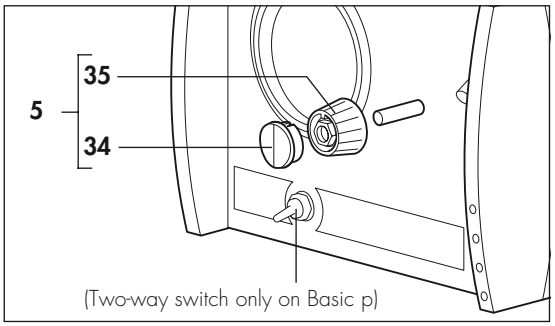


6.8 Replacing ventilation control knob

Tools required:

- Crosstip screwdriver, size 2,
- L-handled socket wrench 10 mm,
- Special tool WM 22829 from special tool set WM 15349,
- Calibration device WM 22836.

1. Remove the faulty ventilation control knob **5**. To do so, proceed as follows:
   - Turn the control knob **35** as far as it will go to the left, so that you have a reference point when reassembling later.
   - Prise off the cover **34**.
   - Hold the control knob with the special tool and undo the nut with a tubular socket spanner (10 mm).
   - Pull the control knob **35** off.
2. Attach the new control knob **35**:
   - Push the control knob **35** onto the spindle almost as far as it will go.
   - Turn the knob until the white line points to the lowest MV value.
   - Hold the knob with the special tool and tighten the nut to secure it.
3. Check the control knob **35** readings: at the left stop the white line must point to the lowest MV value, at the right stop it must point to the highest value. If this is not the case, slacken the nut and align the control knob correctly.
4. Place the cover **34** on the control knob **35**.
5. Perform calibration (see "6.9 Calibration after removal of PCB, ventilation control knob 5 and/or pneumatic block" on page 25).



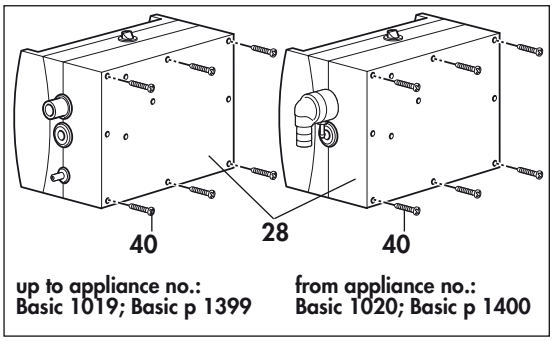
6.9 Calibration after removal of PCB, ventilation control knob 5 and/or pneumatic block

The ventilation control knob **5** controls an EPROM on the printed circuit board of the MEDUMAT Basic / Basic p. To ensure correct setting of the minute ventilation, the EPROM must be calibrated after every removal of the PCB, the control knob **5** or the pneumatic block.

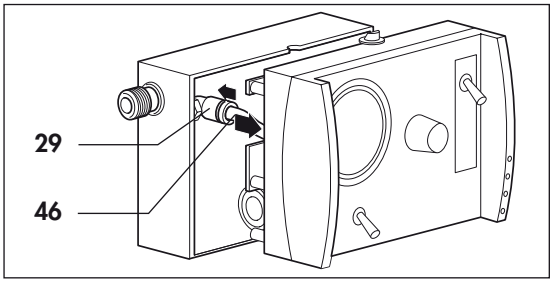
Tools required:

- Crosstip screwdriver, size 2
- Calibration device WM 22836.

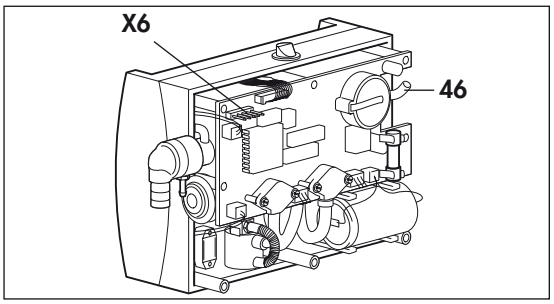
1. Remove the back of the housing. To do so:
   - Place the device on a non-slip surface and unscrew the 6 screws **40** from the back of the device.
   - Pull off the lower part of the housing **28** and swing it out of the way.



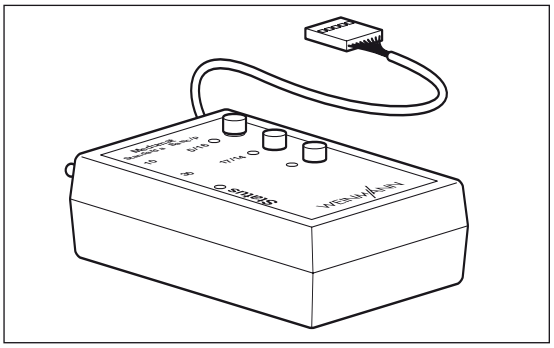
2. Now detach the connecting tube **46** from the oxygen inlet by pushing back the angular bush **29** and pulling out the tube.



3. Switch the calibration device off at the toggle switch. The **Status** LED is not on.
4. Connect the power cord of the calibration device to connector **X6** on the circuit board of the MEDUMAT Basic / Basic p.



5. Switch on the MEDUMAT Basic / Basic p. You must hear the valve switch.
6. Switch on the calibration device at the toggle switch. The **Status** LED lights up.
7. Press the bottom button **Start/Stop** on the calibration device. When it is pressed, all the LEDs on the calibration device light up.



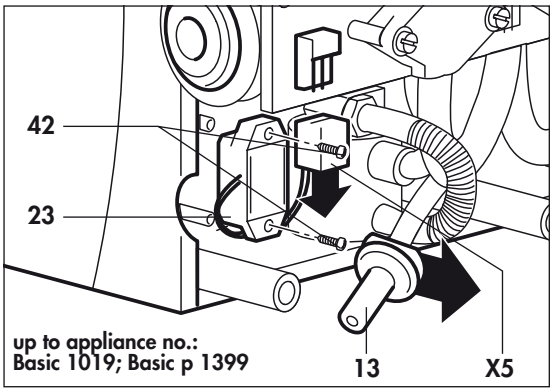
8. As soon as you release the **Start/Stop** button, communication between the devices is automatically established. While this is happening, the LEDs **5/16**, **17/14** and **Start/Stop** flash. Once the **Start/Stop** LED stay on continuously and LEDs **5/16** and **17/14** have gone out, communication is established. The solenoid valve of the MEDUMAT Basic / Basic p does not switch any more.
9. Turn the ventilation control knob **5** on MEDUMAT to the setting MV=5, frequency=16.
10. Press the middle button on the calibration device. The corresponding LED **5/16** must light up.
11. Turn the ventilation control knob **5** on MEDUMAT to the setting MV=17, frequency=14.
12. Press the middle button on the calibration device. The corresponding LED **17/14** must light up.
13. Press the bottom button **Start/Stop** on the calibration device. All LEDs except **Status** go out. You must hear the solenoid valve of the MEDUMAT Basic / Basic p switching.
14. Switch off the calibration device at the toggle switch.
15. Disconnect the calibration device from the MEDUMAT.
16. Close the device (see "6.5 Closing the device" on page 23).
17. Perform a functional check (see "3. Final Check" on page 8).
18. Turn MEDUMAT Basic / Basic p off.

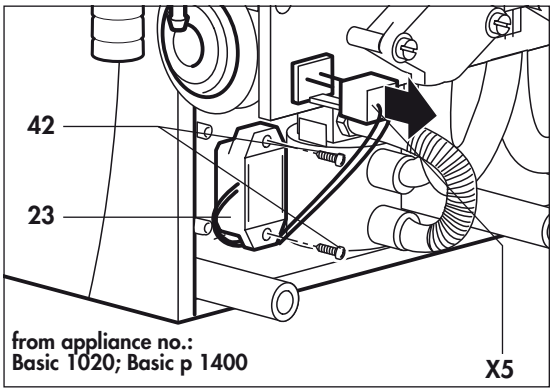
6.10 Replacing the alarm signalling device

Tools required:

- Crosstip screwdriver, size 2,
- Crosstip screwdriver, size 1.

1. Open the device (see "6.4 Opening the device" on page 22).
2. **Up to appliance no.: Basic 1019; Basic p 1399** Pull the pressure measurement connection **13** upwards out of the housing wall.
3. Pull the connector **X5** from the circuit board.
4. Unscrew both screws **42**.
5. Remove the defective alarm signalling device **23**.
6. Insert the new alarm signalling device **23**.
7. Secure the alarm signalling device using the two screws **42**.
8. Push the connector **X5** onto the contacts on the circuit board.
9. **Up to appliance no.: Basic 1019; Basic p 1399** Push the pressure measurement connection **13** into the wall of the housing.
10. Close the device (see "6.5 Closing the device" on page 23).
11. Perform a functional check (see "3. Final Check" on page 8).



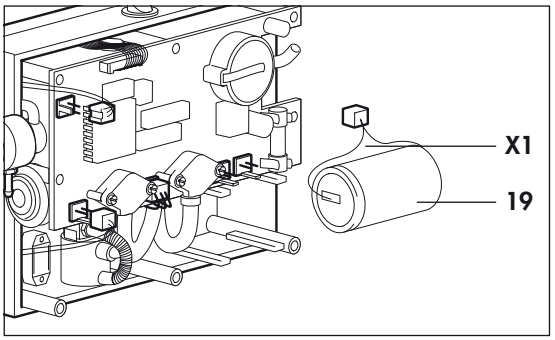


6.11 Replacing two-way switch for maximum ventilation pressure (MEDUMAT Basic / Basic p Basic p only)

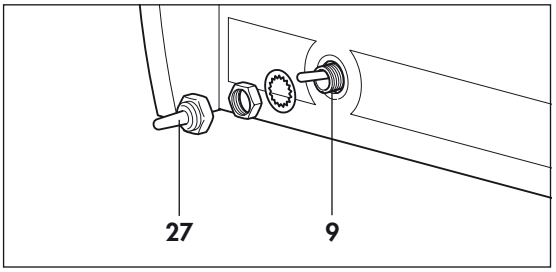
Tools required:

- Crosstip screwdriver, size 2,
- Special socket spanner SW8 WM 22826.

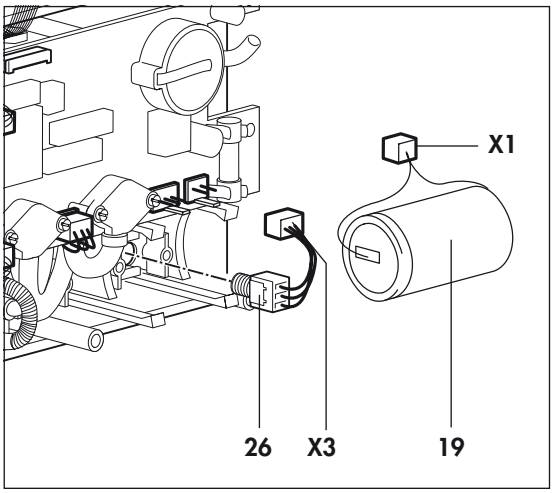
1. Open the device (see "6.4 Opening the device" on page 22).
2. The main battery **19** can be removed by lifting the battery out of its holder and then pulling connector **X1** from the circuit board.
   Pull on the connector only, not on the lead!
3. Turn the MEDUMAT Basic / Basic p round.

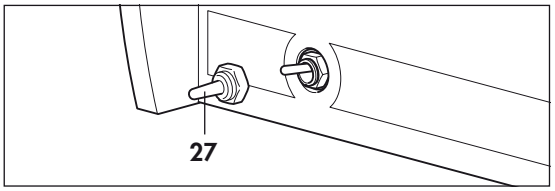


4. Unscrew the cap **27** from the two-way switch **9**.
5. Unscrew the nut with the special socket spanner.



6. Detach connector **X3** from the PCB.
7. Remove the toggle switch **26**.
8. Insert a new toggle switch **26** so that the **red wire points to the wall of the housing**. This is the only way to guarantee that the switch toggles correctly.
9. Turn the MEDUMAT around and secure the toggle switch firmly by tightening the nut.
10. Push the connector **X3** onto the PCB contacts.
11. Connect the battery connector **X1** to the PCB and place the battery **19** in its holder.
12. Close the device (see "6.5 Closing the device" on page 23).
13. Turn the MEDUMAT Basic / Basic p round.
14. Screw the cap **27** onto the toggle switch.
15. Perform a functional check (see "3. Final Check" on page 8).





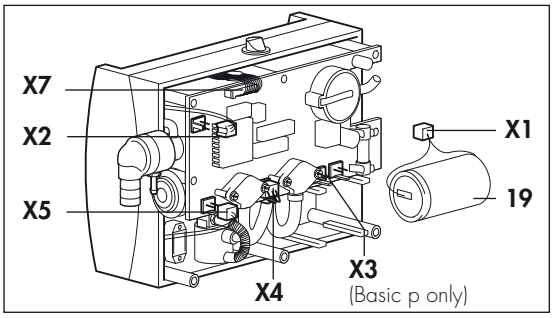
6.12 Replacing the circuit board

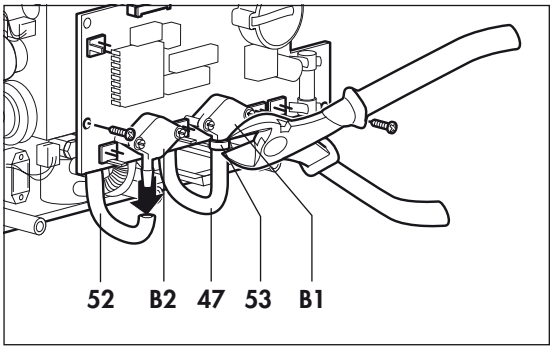
Tools required:

- Crosstip screwdriver, size 2,
- Side nippers,
- Cable tie,
- Calibration device WM 22836.

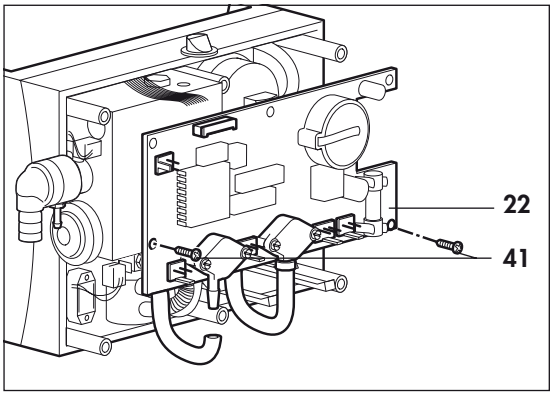
1. Open the device (see "6.4 Opening the device" on page 22).
2. Remove the battery **19** by lifting it out of its holder and then pulling connector **X1** from the circuit board.
   Only pull on the connector, not on the lead!
3. Pull connectors **X2, X5, X4** (and also connector **X3** in Basic p) from the circuit board.
4. Release the flat cable from the locking device **X7**: To do so, pull the upper part of the locking device upwards. You can then pull out the cable.
5. Carefully pull the tube **52** from the sensor **B2**.
6. Using side nippers, cut through the cable tie **53** at the tube **47**.
7. Carefully pull the tube **47** from the sensor **B1**.

   If the tube cannot be pulled off, you may cut through it (e.g. using a scalpel).
   In such cases, the tube must be replaced (as explained in step 9.

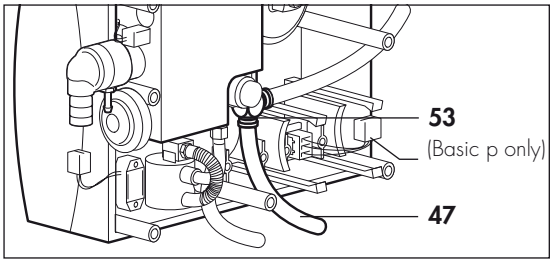




8. Unscrew the two screws **41** and remove the defective circuit board **22**.

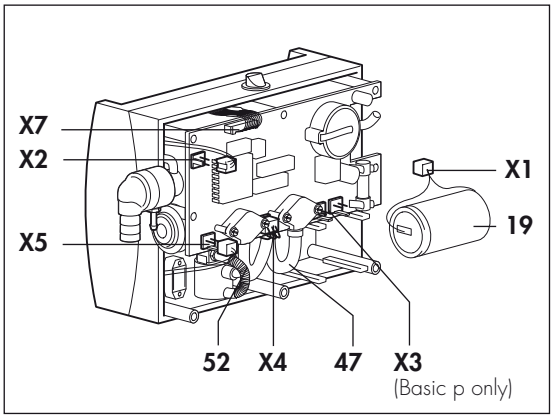


9. If you have cut through the tube **47** under point **7.**, please replace it as follows:
   - Using side nippers, cut through the cable tie **53** at the distributor.
   - Pull off the tube.
   - Slide a new tube **47** onto the distributor and secure with a cable tie.



10. Replace the alarm signalling device (see "6.10 Replacing the alarm signalling device" on page 27).
11. Place the new circuit board **22** onto the spacer brackets. The points of the spacer brackets snap into the circuit board.

    Make sure that no leads are beneath the circuit board, where they may be pinched.
12. Secure the circuit board with the two short screws **41**.
13. Slide the tube **52** onto the sensor **B2**.
14. Slide the tube **47** onto the sensor **B1** and secure it there with a cable tie.
15. Push the connectors **X2**, **X5**, **X4** (and also connector **X3** in the Basic p) onto the contacts of the circuit board.
16. Connect the connector **X1** of the battery to the circuit board and insert the battery **19** into the holder. Avoid pinching the battery cables.
17. Place the flat cable into the locking device **X7**: To do so, pull the upper part of the locking mechanism upwards, slide the cable into it, and press the upper part down again.
18. Perform calibration (see "6.9 Calibration after removal of PCB, ventilation control knob 5 and/or pneumatic block" on page 25).
19. Close the device (see "6.5 Closing the device" on page 23).
20. Perform a functional check (see "3. Final Check" on page 8).



6.13 Replacing the pressure gauge

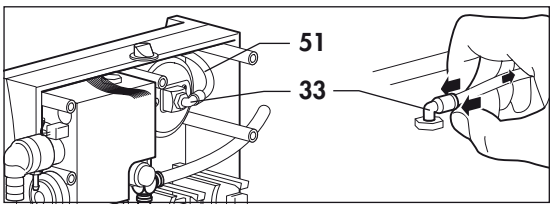
Note: The pressure gauge is identical to the respiratory pressure meter described in the instructions for use.

Tools required:

- Crosstip screwdriver, size 2,
- Open-ended spanner SW 7,
- If necessary, side nippers,
- If necessary, cable tie.

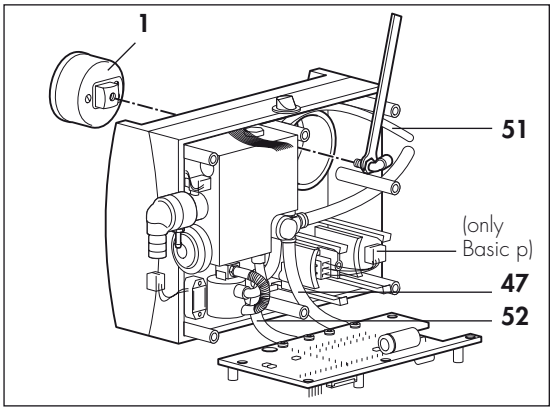
1. Open the device (see "6.4 Opening the device" on page 22).
2. Unscrew the circuit board (see „6.12 Replacing the circuit board" on page 29, steps **2.** to **9.**).

   The tubes 52 and 47 may be left on the circuit board.
3. Release the pressure gauge tube **51** by pushing back the sleeve of the swivel screw connection **33** and pulling out the tube.



4. Using an open-ended spanner (SW 7), unscrew the swivel screw connection **33** from the pressure gauge **1**.
5. Using your fingers, press the pressure gauge **1** out of its holder.
   Tip:
   You will find the pressure gauge easier to remove if you dribble a small amount of spirit between the pressure gauge and the holder.
6. Wet a new pressure gauge **1** with a small amount of spirit and press it into the holder.

   Take care to install the gauge in the right position, so that it is easy to read.
7. Screw the swivel screw connection **33** onto the pressure gauge.
8. Push the pressure gauge tube **51** into the angular bush as far as it will go.
9. Secure the circuit board (see „6.12 Replacing the circuit board" on page 29, steps **11.** to **18.**).
10. Close the device (see "6.5 Closing the device" on page 23).
11. Perform a functional check (see "3. Final Check" on page 8).

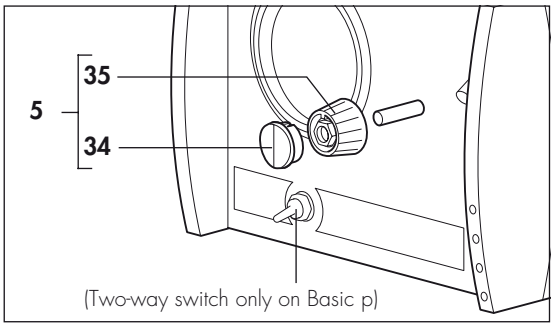


6.14 Replacing the pneumatic block

Tools required:

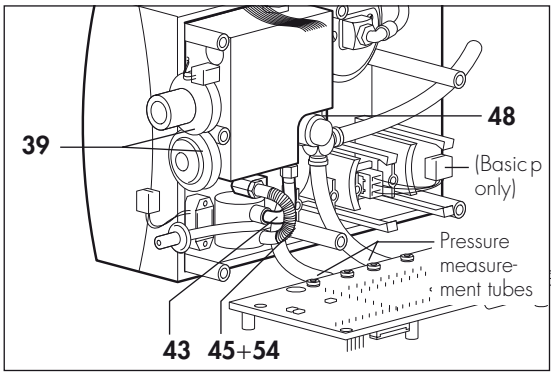
- Crosstip screwdriver, size 2,
- L-handled socket wrench 10 mm,
- Special tool WM 22829 from special tool set WM 15349,
- If necessary, side nippers,
- If necessary, cable tie,
- Calibration device WM 22836.

1. Remove the ventilation control knob **5**. To do so, proceed as follows:
   - Turn the control knob **35** as far as it will go to the left, so that you have a reference point when reassembling later.
   - Lift off the lid **34**.
   - Using the special tool, hold the control knob steady and loosen the nuts with an L-handled socket wrench (10 mm).
   - Pull off the control knob **35**.

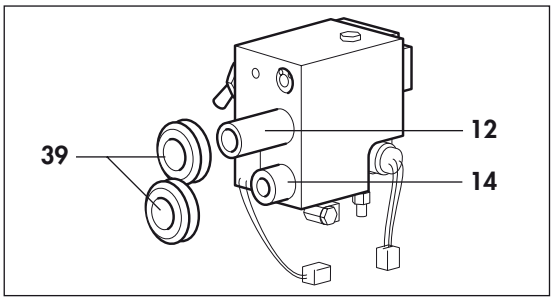


2. Open the device (see "6.4 Opening the device" on page 22).
3. Unscrew the circuit board (see „6.12 Replacing the circuit board" on page 29, steps **2.** to **9.**).

   You can leave the pressure measurement tube 47 attached to the circuit board.
4. Release the pressure tube **48** by pushing back the sleeve of the inlet and pulling out the tube.
5. Pull the ventilation tube **45** from the pneumatic block **24**.
6. Pull the suction connector **43** from the pneumatic block **24**.
7. Carefully pull the defective pneumatic block upwards out of the housing.
8. Pull off the two grommets **39**.



9. Take a new pneumatic block **24** and push the grommets **written side first** onto the connection **12** and the valve **14**.



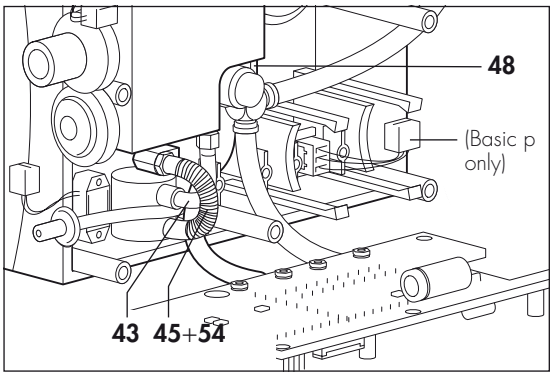
10. Insert the new pneumatic block into the housing.

    Make sure,

    – That you push the rocker and the spindle through the corresponding holes in the housing
    – That no tubes or leads are underneath the pneumatic block where they may be pinched
    – That the grommets are positioned correctly in the housing wall (the housing wall must be in the groove)
    – That the pneumatic block is resting on the four rubber buffers.

11. Slide the suction connector **43** and the ventilation tube **45** with the spring **54** onto the corresponding connections on the pneumatic block **24** as far as they will go.

12. Slide the pressure tube **48** into the inlet of the pneumatic block as far as it will go.

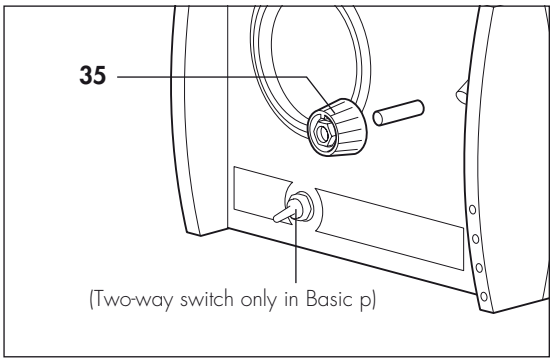


13. Secure the circuit board (see „6.12 Replacing the circuit board" on page 29, steps **11.** to **17.**).

14. Turn the MEDUMAT Basic / Basic p round.

15. Attach the control knob **35**. To do so, proceed as follows:

    – Slide the control knob **35** onto the spindle as far as it will go.
    – Turn the knob until the white line points to the lowest value.
    – Hold the knob steady with the special tool and screw it down.



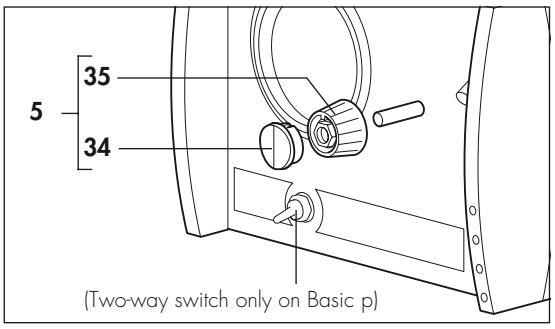
16. Check the display on the control knob **35**: when the knob is turned to the left stop the white line must point to the lowest MV value, when it is turned to the right stop the line must point to the highest value. If this is not the case, loosen the nuts and align the control knob **35**.

17. **Perform calibration (see "6.9 Calibration after removal of PCB, ventilation control knob 5 and/or pneumatic block" on page 25)**.

18. Close the device (see "6.5 Closing the device" on page 23).

19. Turn the MEDUMAT Basic / Basic p round.

20. Place the lid **34** on the knob **35**.
21. Perform a functional check (see "3. Final Check" on page 8).



6.15 Replacing the pneumatic block with angled outlet

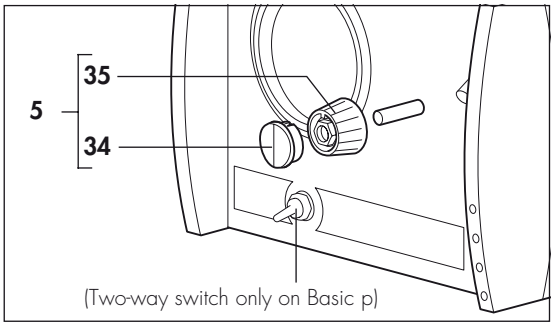
The pneumatic block with angled outlet is fitted as standard to MEDUMAT Basic / Basic p Basic from appliance No. 1020 and to MEDUMAT Basic / Basic p Basic p from appliance No. 1400 onward. Old appliances should be converted not later than the 6-year service.

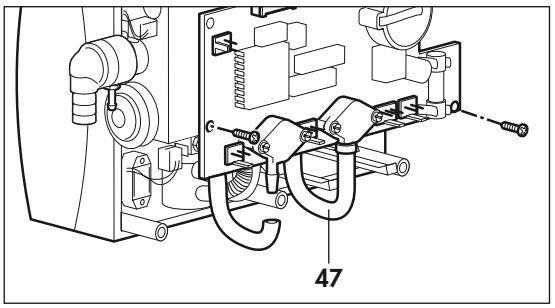
Tools required:

- Crosstip screwdriver, size 2,
- L-handled socket wrench 10 mm,
- Special tool WM 22829 from special tool set WM 15349,
- If necessary, side nippers,
- If necessary, cable tie,
- Special pliers WM 22928,
- Calibration device WM 22836.

1. Remove the ventilation control knob **5**. To do so, proceed as follows:
   - Turn the control knob **35** as far as it will go to the left, so that you have a reference point when reassembling later.
   - Lift off the lid **34**.
   - Using the special tool, hold the control knob steady and loosen the nuts with an L-handled socket wrench (10 mm).
   - Pull off the control knob **35**.
2. Open the device (see "6.4 Opening the device" on page 22).
3. Unscrew the circuit board (see „6.12 Replacing the circuit board" on page 29, steps **2.** to **9.**).

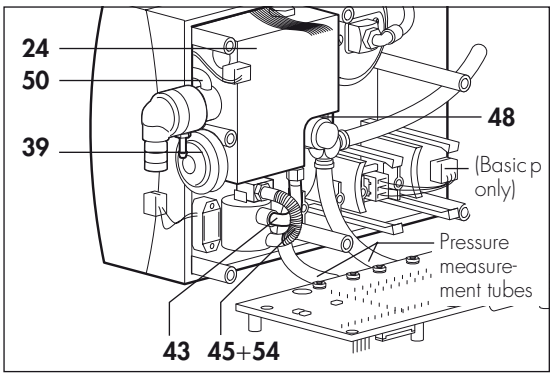
   You can leave the pressure measurement tube 47 attached to the circuit board.

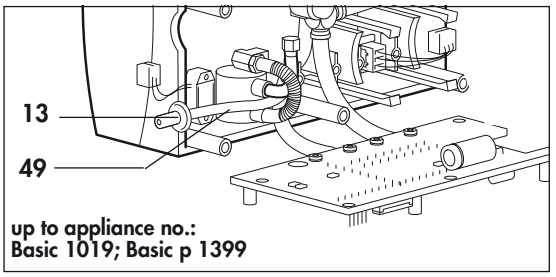




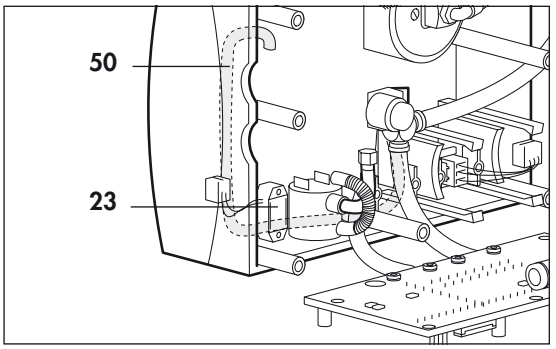
4. Pull the ventilation tube **45** from the pneumatic block **24**.
5. Pull the suction connector **43** from the pneumatic block **24**.
6. Release the pressure tube **48** by pushing back the sleeve of the inlet and pulling out the tube.
7. **For devices with an angled connector:** Detach pressure measurement tube **50** from the tube connector on pneumatic block **24**.
8. Carefully pull the defective/old pneumatic block upwards out of the housing.
9. Pull off the grommet **39** from the pneumatic block **24**.

   For conversion of appliances up to No. 1019 (Basic) or 1399 (Basic p): go to step **10.**.
   For replacement in appliances from No. 1020 (Basic) or 1400 (Basic p) onward: go to step **13.**.
10. Remove connection **13** for the pressure measurement tube from the upper part of the housing.

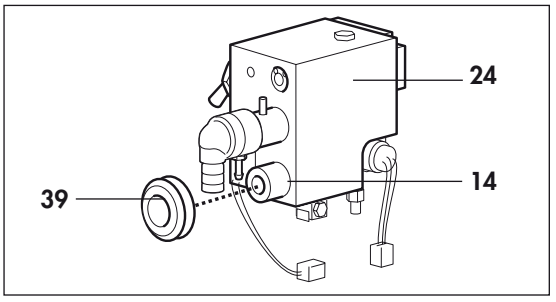




11. Pull tube **49** off the T-piece and replace it with the new tube **50** (use **WM 22967**!).
12. Route the tube so that it is below the valve insert locator and the alarm unit **23** and run it along the inside wall of the housing.



13. Take a new or replacement pneumatic block **24** and push the grommet **39 written side first** onto the valve **14**.
14. Insert the new pneumatic block into the housing and push tube **50** onto the pneumatic block.



15. Now take the swivelling angled connector and push it onto the connector of the pneumatic block. To fit the swivelling angled connector properly into the upper housing section, lift the pneumatic block slightly and push it over the outer wall of the housing.

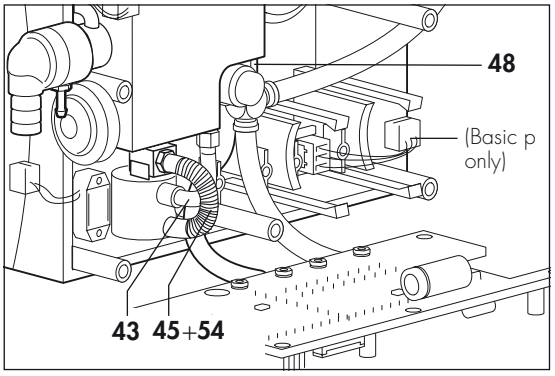
    Make sure,

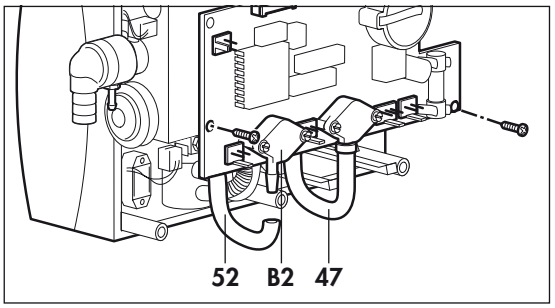
    – That you push the rocker and the spindle through the corresponding holes in the housing
    – That no tubes or leads are underneath the pneumatic block where they may be pinched
    – That the grommet is positioned correctly in the housing wall (the housing wall must be in the groove)
    – That the pneumatic block is resting on the four rubber buffers.

    For conversion: go to step **16.**.

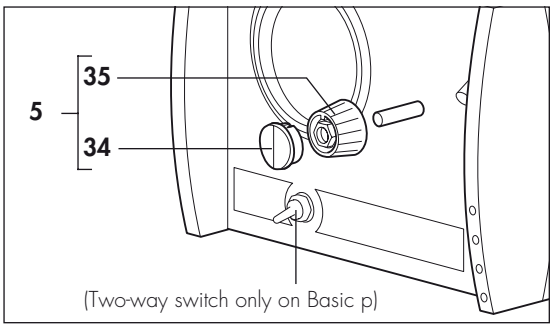
    For replacement: go to step **18.**.

16. Where present: If you have a device that you have converted to a swivelling angled connector, you must insert sealing plug WM 22809 with O-ring 5-1.2 WM 1145/90 into the upper part of the housing where the pressure sensor tube was previously fitted.
17. Remove the "**Sensor**" plate from the housing.
18. Slide the suction connector **43** and the ventilation tube **45** with the spring **54** onto the corresponding connections on the pneumatic block **24** as far as they will go.
19. Slide the pressure tube **48** into the inlet of the pneumatic block as far as it will go.
20. Secure the circuit board (see „6.12 Replacing the circuit board" on page 29, steps **11.** to **17.**).
21. Slide the tube **52** onto the sensor **B2**.
22. Turn the MEDUMAT Basic / Basic p round.





23. Attach the control knob **35**. To do so, proceed as follows:
    - Slide the control knob **35** onto the spindle as far as it will go.
    - Turn the knob until the white line points to the lowest value.
    - Hold the knob steady with the special tool and screw it down.



24. Check the display on the control knob **35**: when the knob is turned to the left stop the white line must point to the lowest MV value, when it is turned to the right stop the line must point to the highest value. If this is not the case, loosen the nuts and align the control knob **35**.
25. **Perform calibration (see "6.9 Calibration after removal of PCB, ventilation control knob 5 and/or pneumatic block" on page 25)**.
26. Close the device (see "6.5 Closing the device" on page 23).
27. Turn the MEDUMAT Basic / Basic p round.
28. Place the lid **34** on the knob **35**.
29. Perform a functional check (see "3. Final Check" on page 8).

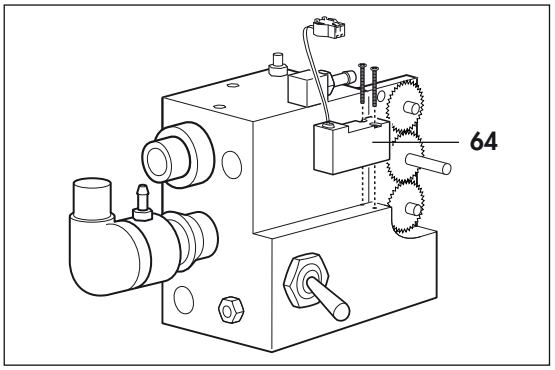
6.16 Replace 3/2 solenoid valve

Tools required:

- Crosstip screwdriver, size 2,
- 10 mm socket wrench,
- Special tool WM 22829 from set WM 15349
- If necessary, side nippers
- If necessary, cable tie
- Special pliers WM 22928
- Calibration device WM 22836
- Crosstip screwdriver, size 0

1. Open the device (see "6.4 Opening the device" on page 22).
2. Remove the pneumatic block (see "6.15 Replacing the pneumatic block with angled outlet" on page 34).

3. Undo the two mounting screws and remove 3/2 solenoid valve **64**.
4. Replace the seal. Ensure that the seal is positioned correctly.
5. Screw new 3/2 solenoid valve **64** tight.
6. Refit the pneumatic block (see "6.15 Replacing the pneumatic block with angled outlet" on page 34).
7. Close the device (see "6.5 Closing the device" on page 23).
8. Perform a functional check (see "3. Final Check" on page 8).



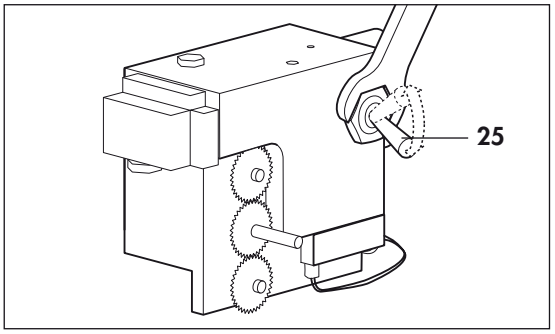
6.17 Changing the Air Mix/No Air Mix switch

Tools required:

- Crosstip screwdriver, size 2,
- L-handled socket wrench 10 mm,
- Open-ended spanner SW 17,
- Special tool WM 22829 from special tool set WM 15349,
- If necessary, side nippers,
- If necessary, cable tie,
- Vice with protective jaws,
- Calibration device WM 22836.

1. **Up to appliance no. 1019 (Basic) or 1399 (Basic p):**
   Remove the pneumatic block from the housing (see „6.14 Replacing the pneumatic block" on page 32, steps **1.** to **7.**).
   From appliance no. 1020 (Basic) or 1400 (Basic p):
   Remove the pneumatic block from the housing (see „6.15 Replacing the pneumatic block with angled outlet" on page 34, steps **1.** to **8.**).
2. Clamp the pneumatic block in a vice with protective jaws.
3. Unscrew the rocker using an open-ended spanner (SW 17).
4. Screw in a new rocker **25** with the seal.

   Take care to ensure the correct installation position:
   The rocker must drop automatically into its end position. It must not become stuck in an intermediate position.



Note:
The rocker will tend to drop into the lower position.

5. **Up to appliance no. 1019 (Basic) or 1399 (Basic p):**
   Re-install the pneumatic block (see „6.14 Replacing the pneumatic block" on page 32, steps **10.** to **20.**).
   From appliance no. 1020 (Basic) or 1400 (Basic p):
   Re-install the pneumatic block (see „6.15 Replacing the pneumatic block with angled outlet" on page 34, steps **14.** to **28.**).
6. Perform a functional check (see "3. Final Check" on page 8).

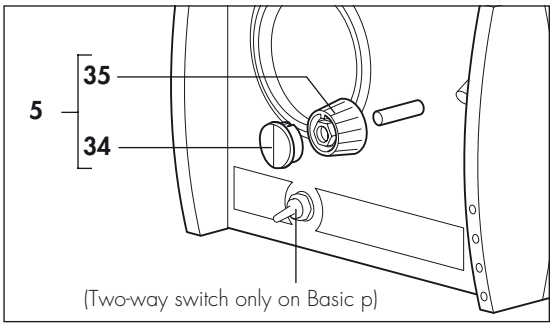
6.18 Replace upper part of housing/control panel

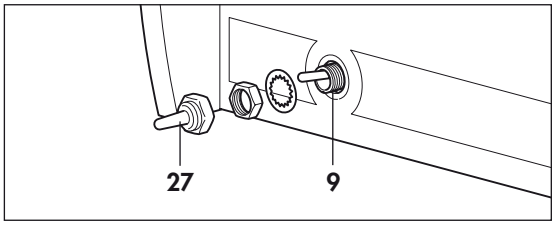
Tools required:

- Crosstip screwdriver, size 2,
- Crosstip screwdriver, size 1,
- L-handled socket wrench 10 mm,
- Special tool WM 22829 from special tool set WM 15349,
- Special socket spanner 8 mm WM 22826,
- Flat nose pliers,
- Side nippers,
- Cable tie,
- Calibration device WM 22836.

Remove upper part of housing

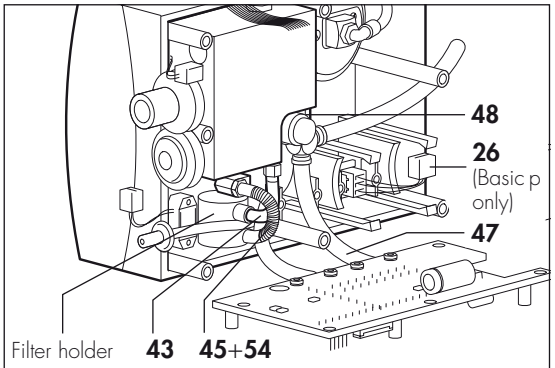
1. Remove the ventilation control knob **5**. Please proceed as follows:
   – Twist the control knob **35** to the left limit so that you have a reference point when you come to re-assemble it.
   – Lift off the lid **34**.
   – Using the special tool, hold the control knob steady and loosen the nuts with an L-handled socket wrench (10 mm).
   – Pull off the control knob **35**.
2. Basic p only:
   – Unscrew the cap **27** from the two-way switch **9**.
   – Unscrew the nut with the special socket spanner.





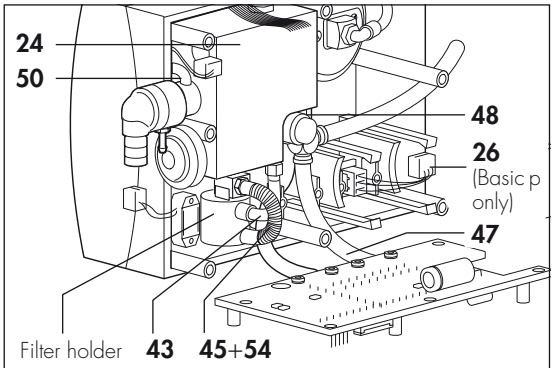
3. Open the device (see "6.4 Opening the device" on page 22).
4. Remove the circuit board (see „6.12 Replacing the circuit board" on page 29, steps **2.** to **9.**).

   The pressure measuring tube 47 may be left on the circuit board.
5. Basic p only: remove the toggle switch **26**.
6. Pull the ventilation tube **45** with the spring **54** from the pneumatic block **24** and the filter holder.
7. Pull the suction connector **43** from the pneumatic block **24** and the filter holder.
8. Release the pressure tube **48** by pushing back the sleeve of the inlet and pulling out the tube.



up to appliance no.:
Basic 1019; Basic p 1399

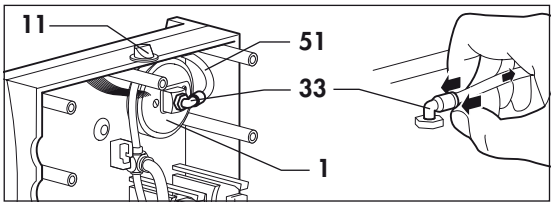
9. Carefully pull the pneumatic block upwards out of the housing.
10. **For devices with an angled connector:**
    Detach pressure measurement tube **50** from the tube connector on pneumatic block **24**.



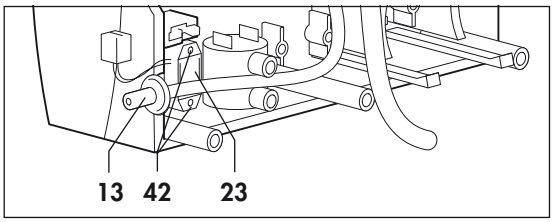
from appliance no.:
Basic 1020; Basic p 1400

11. Release the pressure gauge tube **51** by pushing back the sleeve of the swivel screw connection **33** and pulling out the tube.
12. Using your fingers, press the pressure gauge **1** out of the pressure gauge holder.

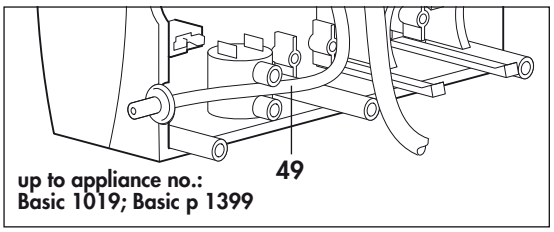
    Tip:
    You will find the pressure gauge easier to remove if you dribble a small amount of spirit between the pressure gauge and the holder.
13. Press the pressure gauge holder out of the housing.
14. Take locking latch **11** out of the housing wall.

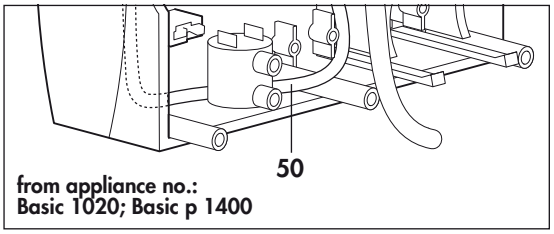


15. **For conversion up to appliance No. 1019 (Basic) or 1399 (Basic p):**
    Pull the pressure measurement connection **13** upwards out of the housing wall.
16. Unscrew both the screws **42** and remove the alarm signalling device **23**.

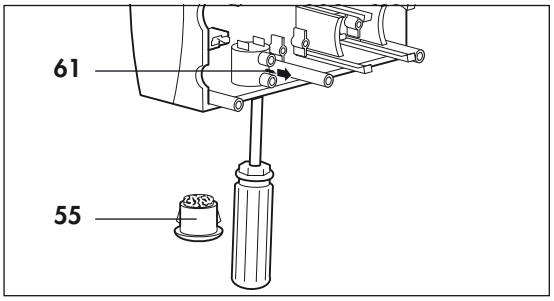


17. **For conversion up to appliance No. 1019 (Basic) or 1399 (Basic p):**
The pressure measuring tube **49** is secured to the housing with a cable tie. Cut through the cable tie with side nippers and remove the tube or pull the tube off upwards the housing with the cable tie.

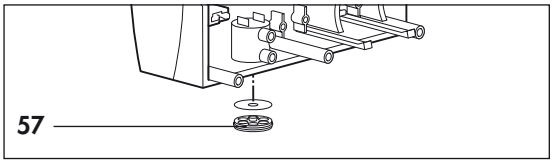




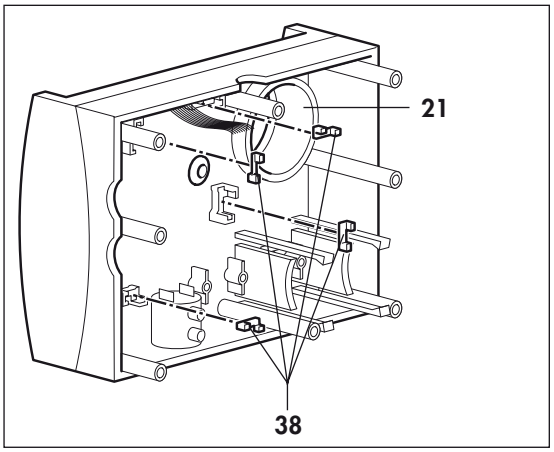
18. Remove the filter insert:
   – Pull the filter cap **55** out of the housing wall.
   – Using a screwdriver, press out the pin **61**.



   – Take the valve insert **57** out of the receptacle in the housing e.g. by tilting it with a small screwdriver then pulling it out with flat nose pliers.



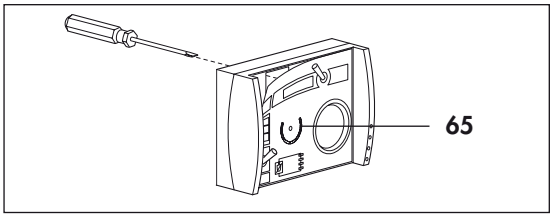
19. Finally, remove the four rubber buffers **38**.



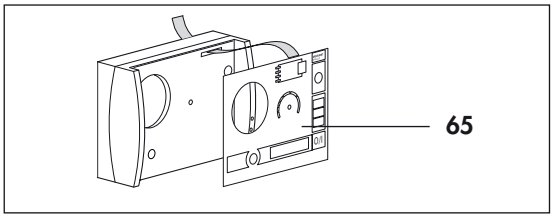
If you are not replacing the control panel, continue at "Fit upper part of housing".

Replace control panel

1. Remove upper part of housing (see above).
2. Push a screwdriver against the metal panel from the inside until control panel **65** comes loose.
3. Remove adhesive residues completely from the upper part of the housing.



4. Pass the ribbon cable of new control panel **65** through the slot in the upper part of the housing and glue on control panel **65**.

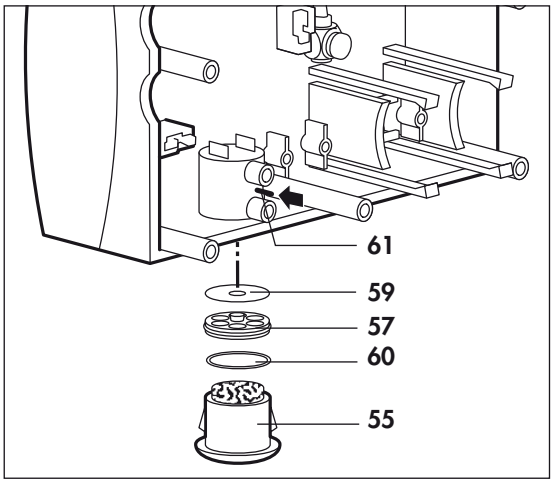


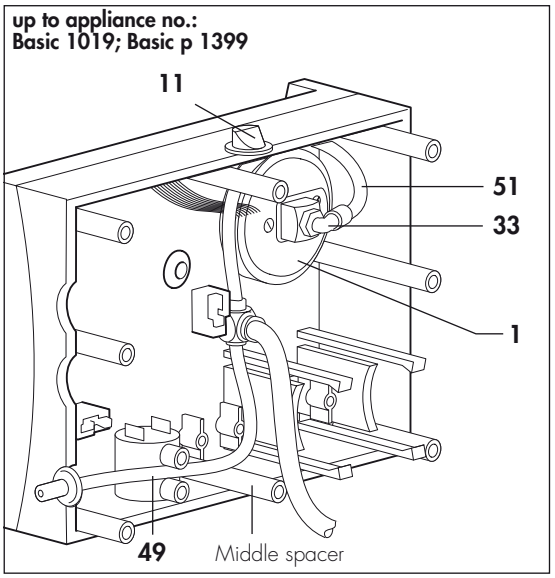
Fit upper part of housing

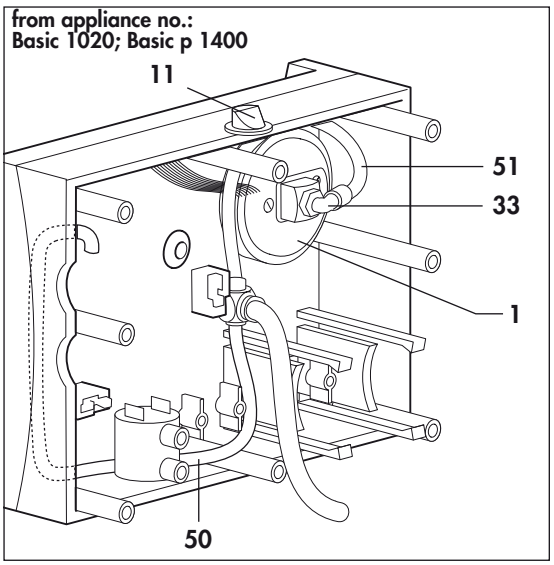
1. If your MEDUMAT Basic / Basic p is not to be updated (straight connection on pneumatic block), you will first have to file away a semi-circle for the pressure measurement connection **13**.
2. Push the pressure gauge mounting **21** into the new upper housing section **20**.
3. Wet the rubber buffers **38** with a little spirit and insert them.
4. Install the filter insert:
   - Insert O-ring **60** in the corresponding groove in the valve insert.
   - Check that the membrane **59** is lying flush and smooth against the valve insert **57**.
   - Press the valve insert, membrane first, into the filter holder.
     After installing, make sure that the valve insert is lying straight in the holder.
   - Take the pin **61** in your hand. The pin has a notched side and a smooth side. Press the pin with the **smooth** side forwards into the small hole on the top of the filter holder until it is flush with the holder. The pin holds the valve insert in position.
   - Push the filter cap **55** into the housing wall.
5. Wet the pressure gauge **1** with a small amount of spirit and press it into the holder.

   Observe the installation position so that the display remains clearly legible.
6. Push the pressure gauge tube **51** into the swivel screw connection **33** as far as it will go.
7. Place the pressure gauge tube **51** and the pressure measuring tube **49**/**50** into the housing as illustrated.
8. **For conversion up to appliance No. 1019 (Basic) or 1399 (Basic p):**
   Secure the pressure measuring tube **49** to the middle spacer with a cable tie.
9. Push locking latch **11** into the housing wall.

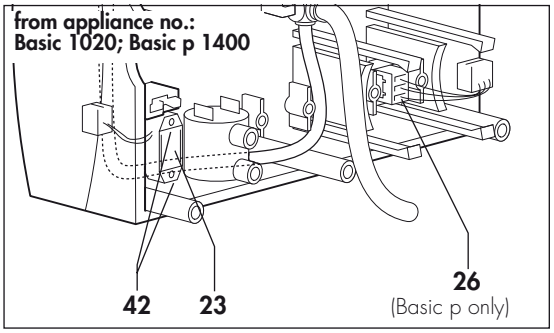
   Remember that the slanted surface needs to be pointing towards the device base later.





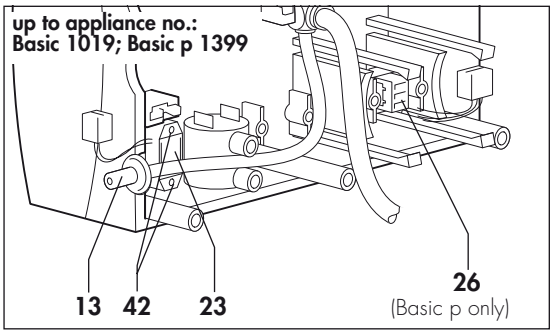


10. Basic p only:
    - Insert the toggle switch **26** so that the **red wire points to the wall of the housing**. This is the only way to ensure the switch toggles correctly.
    - Turn the MEDUMAT round and secure the toggle switch by tightening the nut.



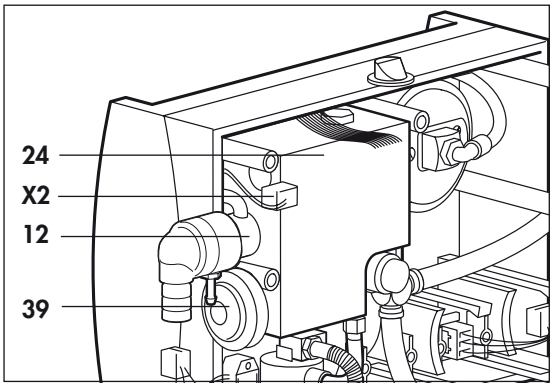
11. Insert the alarm signalling device **23** and secure it with the screws **42**.

12. **For conversion up to appliance No. 1019 (Basic) or 1399 (Basic p):**
    Push the connection **13** into the housing wall.

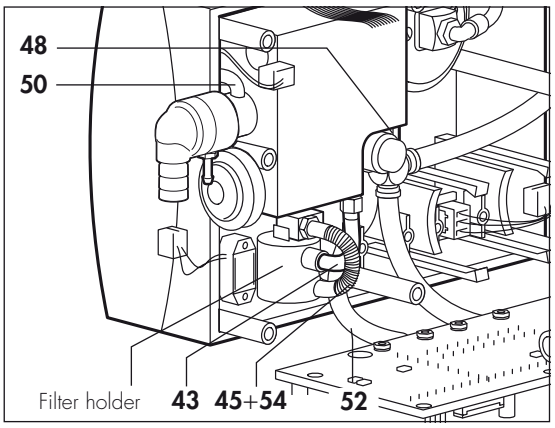


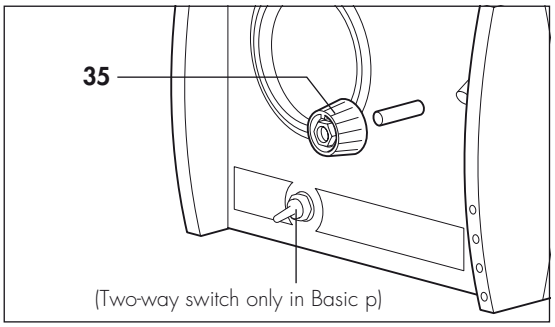
13. Insert the new pneumatic block **24** into the housing.

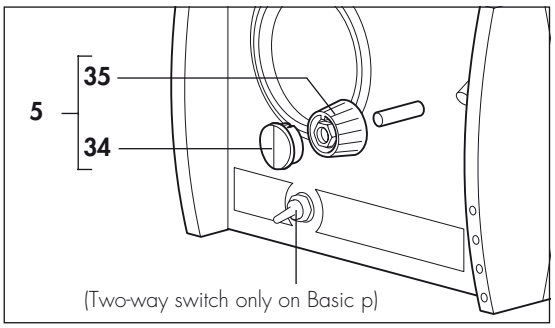
    Make sure that
    - the connector **X2** (on the long cable) is beside the connection **12**.
    - you push the rocker and the spindle through the corresponding holes in the housing.
    - no tubes or leads are underneath the pneumatic block where they may be pinched.
    - the grommet **39** is positioned correctly in the housing wall (the housing wall must be in the groove).
    - the pneumatic block is resting on the four rubber buffers.



14. Make the tube connections:
    - Push the suction connector **43** onto the rear nozzle of the filter holder and onto the connection on the pneumatic block **24**.
    - Using the ventilation tube **45** with the spring **54**, connect the front nozzle of the filter holder to the pneumatic block **24**.
    - Make sure that all the tube ends are pushed on to the limits.
15. Slide the pressure tube **48** into the inlet of the pneumatic block as far as it will go.
16. Slide pressure measurement tube **50** onto the tube connection of the angled outlet.
17. Secure the circuit board (see „6.12 Replacing the circuit board" on page 29, steps **11.** to **17.**).
18. Turn the MEDUMAT Basic / Basic p round.
19. Secure the ventilation control knob **5**. Please proceed as follows:
    - Push the control knob **35** onto the spindle just short of the limit.
    - Twist the knob until the white line is pointing to the lowest value.
    - Hold the knob steady with the special tool and screw it down.
20. Check the display on the control knob **35**: when turned to the left stop, the white line must point to the lowest MV value.
    If this is not the case, loosen the nuts and align the control knob **35**.
21. **Perform calibration (see "6.9 Calibration after removal of PCB, ventilation control knob 5 and/or pneumatic block" on page 25).**
22. Close the device (see "6.5 Closing the device" on page 23).
23. Place the lid **34** on the knob **5**.
24. Basic p only:
    Carefully screw the cover **27** onto the two-way switch **9**.
25. Perform a functional check (see "3. Final Check" on page 8).





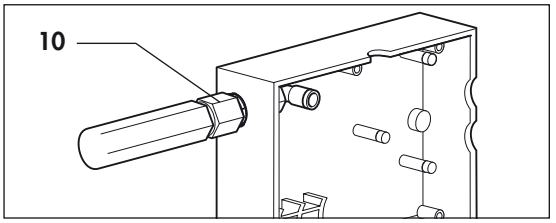


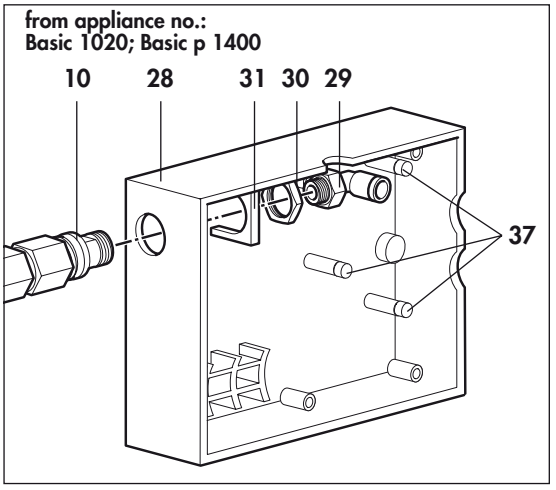
6.19 Replacing the housing base section

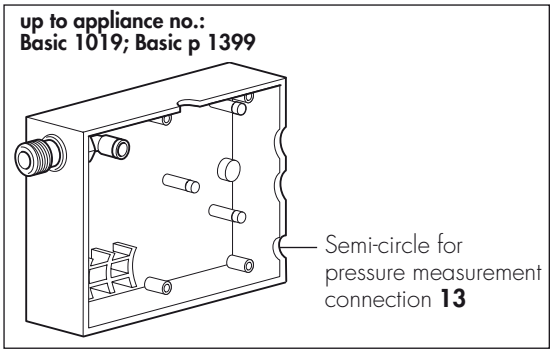
Tools required:

- Crosstip screwdriver, size 2,
- Open-ended spanner SW 13,
- Open-ended spanner SW 22,
- Special locknut tool G 3/8 WM 22827 and special spanner SW 17 WM 22828 from the special tool set WM 15349,
- Vice with protective jaws.

1. Open the device (see "6.4 Opening the device" on page 22).
2. Screw the special locknut tool onto the compressed gas connection **10**.
3. Clamp the special locknut tool in a vice.
4. Tighten the nuts of the special locknut tool against the pressure connection using an open-ended spanner (SW 22).
5. Unscrew the angular bush **29** using an open-ended spanner (SW 13).
6. Using the special spanner (SW 17), loosen the nut **30** and unscrew it.
7. Pull out the plate **31** upwards.
8. Remove the housing base section **28**.
9. Remove rubber buffer **37** from the old device.
10. Place a new housing base section **28** on the compressed gas connection **10**.
11. Slide the plate **31** on the inside of the housing onto the connection.
12. Tighten the nut **30** on the inside of the connection.
13. Secure the angular bush **29** the connection.
14. Loosen the nuts of the special locknut tool using the open-ended spanner (SW 22).
15. Open the vice.
16. Unscrew the special locknut tool from the compressed gas connection **10**.
17. If your MEDUMAT Basic / Basic p is not to be updated (straight connection on pneumatic block), you will first have to file away a semi-circle for the pressure measurement connection **13**.
18. Moisten the rubber buffers **37** of the defective housing with a little spirit and insert them in the new housing.
19. Close the device (see "6.5 Closing the device" on page 23).
20. Perform a functional check (see "3. Final Check" on page 8).







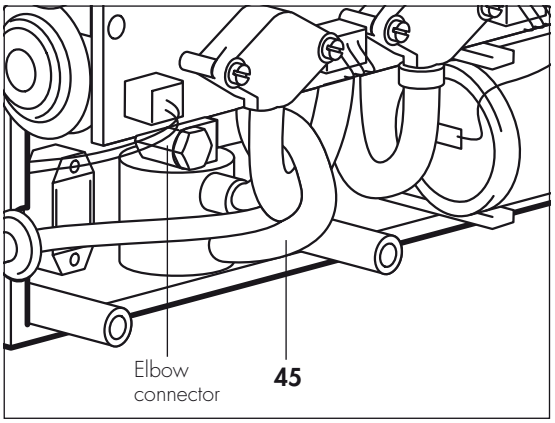
6.20 Upgrading ventilation tube

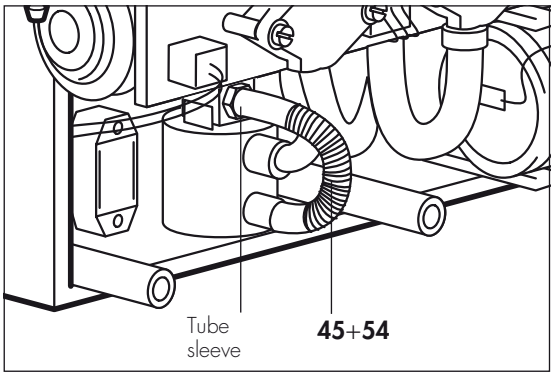
In order to reduce the ventilation resistance of the respiration tube, the ventilation tube **45** on devices up to device number 1011 (Basic) or 1137 (Basic p) should be upgraded in the course of the two-yearly service. In addition a spring **54** is installed to prevent kinks in the tube.

Tools required:

- Crosstip screwdriver size 2,
- Socket wrench 7 mm,
- Side nippers or sharp knife,
- Spring **54**.

1. Open the device (see "6.4 Opening the device" on page 22).
2. Pull the ventilation tube **45** off the elbow connection.
3. Unscrew the elbow connection.
4. Unscrew the chromium-plated tube sleeve from the elbow connection.
5. Screw the chromium-plated tube sleeve together with a sealing washer into the connection (where the elbow connection was previously installed).
6. Shorten the ventilation tube **45** to exactly 65 mm.
7. Slide the spring **54** onto the ventilation tube **45**.
8. Push the ventilation tube **45** onto the tube nipple.
9. Close the device (see "6.5 Closing the device" on page 23).
10. Perform a final check (see "3. Final Check" on page 8).





7. Spare parts

7.1 List of spare parts

Note:

The item numbers in the following table match the numbers in the text of these service and repair instructions and the operating instructions.

Item no.	Designation	Order No.
1	Pressure gauge	WM 22539
10	Pressurised gas connection (threaded connection), pre-assembled	WM 22685
11	Twistlock for wall bracket	WM 22642
13	Pressure measuring connection, pre-assembled (up to appliance no. 1019 {Basic} or 1399 {Basic p})	WM 22527
15	Dust protector (foam insert) for pressure relief valve	WM 22585
 17 **19**	Battery set, consisting of: – Button cell CR 2430 – Battery 3,6 Volt	WM 15186 WM 22652 WM 22529
18	Fuse insert F 0,5 L 250 V	WM 22651
20	Upper housing section, complete – Basic – Basic p	 WM 22654 WM 22656
21	Pressure gauge mounting	WM 22504
22	Set printed circuit board, Basic Set printed circuit board, Basic p	WM 15450 WM 15451
23	Alarm signalling device	WM 22553
24	Pneumatic block with angled outlet, complete, new Pneumatic block with angled outlet, complete, replacement	WM 22680 WM 22849
25	Set of rockers (for two-way switch Air Mix/No Air Mix **4**)	WM 15193
26	Toggle switch (for two-way switch Max. Ventilation Pressure **9**)	WM 15188
27	Push-on cap for switch lever (toggle switch)	WM 22644
28	Housing base section, complete* – Basic – Basic p	 WM 22856 WM 22854
29	Angular bush 4/6	WM 22552
30	Nut M 14 x 1.5	WM 22586
31	Torque plate	WM 22509
32	Screw-in connection	WM 22596
33	Swivel screw connection 2/4	WM 22588
34	Lid, blue (Basic up to appliance no. 1010) Lid, blue (Basic p up to appliance no. 1039) Lid, white (Basic from appliance no. 1011) Lid, white (Basic p from appliance no. 1040)	WM 4896 WM 4896 WM 22941 WM 22941

35	Short button	WM 4891
36 **37** **38** **39**	Set of rubber parts, consisting of: – Grommet for potentiometer – Rubber buffer for housing base section – Rubber buffer for upper housing section – Grommet for connections **12** (up to appliance no. 1019 {Basic} or 1399 {Basic p}) and **14**	WM 15190
40 **41** **42**	Set of screws, consisting of: – Fillister-head screw KB 30 x 20 – Fillister-head screw KB 30 x 8 – Fillister-head screw KB 18 x 7,5	WM 15191
43	Suction connector	WM 22598
44 **45** **46** **47** **48** **49** **50** **51** **52** **53**	Set of tubes for MEDUMAT, consisting of: – Tube, silicon 4/7, 65 long – Tube, PU 4/6, 95 long – Tube, PU 4/6, 82 long – Tube, PU 4/6, 30 long – Tube, PU 2/4, 105 long – Tube, PU 1,6/3.2, 220 long (for angled connector) – Tube, PU 2/4, 155 long – Tube, silicon 4/7, 85 long – Cable tie	WM 15187
54	– Spring	WM 22804
55	Cover cap, drilled, for dust filter	WM 4954
56 **57** **58** **59** **60** **61**	Filter insert set, consisting of: – Valve insert, complete – Dust filter – Valve membrane – O-ring 13 x 1.25 – Split taper pin 1,5 x 8	WM 15185
62	Sieve set, consisting of: – Sieve – Seal 3,5 x 6 x 0,5	WM 15284
63	Service label: – for servicing in 1 years time – for servicing in 2 years' time – for servicing in 3 years' time – for servicing in 4 years' time – for servicing in 5 years' time – for servicing in 6 years' time	 WM 0301 WM 75340 WM 0302 WM 75341 WM 75640 WM 75339
64	Magnetic valve	WM 22625
65	Control panel keypad Basic Control panel keypad Basic p	WM 22559 WM 22548
	Instructions for use	WM 16182

* When ordering, please specify the model, device number and year of manufacture.

** When ordering, please specify year of next maintenance

7.2 Maintenance set

Sets for devices already serviced with Set WM 15292 (Basic)/WM 15244 (Basic p) (pneumatic block replacement)

Years	2	4	6	8	10	12	14
Maintenance set Basic	WM 15242	WM 15242	WM 15292	WM 15242	WM 15242	WM 15293	WM 15364
Maintenance set Basic p	WM 15242	WM 15242	WM 15244	WM 15242	WM 15242	WM 15289	WM 15474

Sets for devices not yet serviced with Set WM 15292 (Basic)/WM 15244 (Basic p) (pneumatic block replacement)

Years	2	4	6	8	10	12	14	16
Maintenance set Basic	WM 15242	WM 15242	WM 15242	WM 15292	WM 15242	WM 15293	WM 15242	WM 15364
Maintenance set Basic p	WM 15242	WM 15242	WM 15242	WM 15244	WM 15242	WM 15289	WM 15242	WM 15474

Maintenance set 2 years (for MEDUMAT Basic and Basic p)

Set, WM 15242

consisting of:

- Battery
- Button cell
- Dust filter
- Foam insert for pressure relief valve
- Lip membranes
- Membrane for spontaneous breathing arm
- Seal 3.5 x 6 x 0.5
- Sieve
- Membrane for expiration arm
- O-ring 15 x 1.5
- Valve membrane

Maintenance set 8 years (for MEDUMAT Basic)

Set, WM 15292

consisting of:

- Set WM 15242
- Rubber buffer pad
- Rubber buffer receptacle
- Set of tubes
- Pneumatic block, replacement
- Suction connector
- O-ring 13 x 1.25
- Sealing plug
- O–ring 5 x 1.2

Maintenance set 8 years (for MEDUMAT Basic p)

Set, WM 15244

consisting of:

- Set WM 15242
- Rubber buffer pad
- Set of tubes
- Toggle switch

- Push-on cap for switch lever
- Rubber buffer receptacle
- Pneumatic block, replacement
- Suction connector
- O-ring 13 x 1.25
- Sealing plug

Maintenance set 12 years (for MEDUMAT Basic)

Set, WM 15293

consisting of:

- Set WM 15242
- Printed circuit board /PCB MEDUMAT
- Alarm signalling device
- Cable tie

Maintenance set 12 years (for MEDUMAT Basic p)

Set, WM 15289

consisting of:

- Set WM 15242
- Toggle switch
- Push-on cap for switch lever
- Printed circuit board /PCB MEDUMAT
- Alarm signalling device
- Cable tie

Maintenance set (14) 16 years (for MEDUMAT Basic)

Set, WM 15364

consisting of:

- Set WM 15242
- Rubber buffer pad
- Rubber buffer receptacle
- Set of tubes
- Pneumatic block, new
- Suction connector
- O-ring 13 x 1.25
- Sealing plug
- O–ring 5 x 1.2

Maintenance set (14) 16 years (for MEDUMAT Basic p)

Set, WM 15474

consisting of:

- Set WM 15242
- Rubber buffer pad
- Set of tubes
- Toggle switch
- Push-on cap for switch lever
- Rubber buffer receptacle
- Pneumatic block, new
- Suction connector
- O-ring 13 x 1.25
- Sealing plug

8. Tools and test equipment

Below is a list of all tools and test equipment used in these service and repair instructions.

The particular tools and test equipment required are outlined in the respective chapter.

Special tools can be purchased from the manufacturer Weinmann.

8.1 General tools

- Slotted screwdriver size 0.5 x 3 x 100;
- Crosstip screwdriver, size 1;
- Crosstip screwdriver, size 2;
- Open-ended spanner SW 7
  for tube connection of pressure gauge;
- Socket wrench 7 mm
- Open-ended spanner SW 13,
  for elbow connector at O_2 inlet;
- Open-ended spanner SW 17
  for rocker valves;
- Open-ended spanner SW 22
  for special locknut tool;
- L-handled socket wrench 10 mm
  for control knob;
- Tweezers
  for sieve set;
- Side nippers;
- Flat nose pliers.

8.2 Special tools

The following tools are available from the manufacturers Weinmann:

- Special tool set, consisting of: WM 15349
  - Special locknut tool G 3/8 WM 22827
    for unlocking the threaded connection
    on the O_2 inlet
  - Special spanner SW 17 WM 22828
    for lock nut on O_2 inlet
  - Special tool WM 22829
    for holding the control knob
  - Set: hose with injector WM 15359
  - Special pliers WM 22928
- Set, supply test Medumat / Modules WM 15440
- Set, test set respiration and pressure reducer flow WM 15443
- Special socket spanner SW8, WM 22862
  for removing toggle switch for P_{max}
  in MEDUMAT Basic / Basic p Basic p
- Calibration device WM 22836

8.3 Test equipment

- Oxygen concentration measuring device, Type Oxycontrol WM 13550
- Volumetric flowmeter

  Type Flow Analyser PF-300
  obtainable from:
  SI-special instruments GmbH
  Strelgasse 2
  D-86720 Nördlingen
  Tel.: +49 90 81 / 2 20 61 or 2 20 62
  Fax: +49 90 81 / 2 20 63
  www.specialinstruments.com

  or

  Type RT 200 (Timeter)

  obtainable from:
  Allied Healthcare Products Inc.
  1720 Sublette Avenue
  St. Louis, Missouri, MO 63110
  USA

  Tel.: 001-800-444-3954
  Fax: 001-314-771-5183

  or

  Type EKU VIP-Ventilatortester

  obtainable from:
  EKU Elektronik GmbH
  Feldstrasse 9a
  56291 Leiningen

  Tel.: 06746-1018
  Fax: 06746-8484
  www.eku-elektronik.de
- Test set for final check WM 15339
- Adjustable orifice, e.g. ball valve,
  internal diameter ≥ 10 mm
- Pressure gauge 0 to 6.3 bar, class 1.6;
- Pressure gauge 0 – 100 mbar, class 1.6

  Type WIKA

  obtainable from:
  Alexander Wiegand GmbH & Co.
  Alexander-Wiegand-Strasse 30
  63911 Klingenberg am Main
  Tel. 09372/1320

9. Technical data

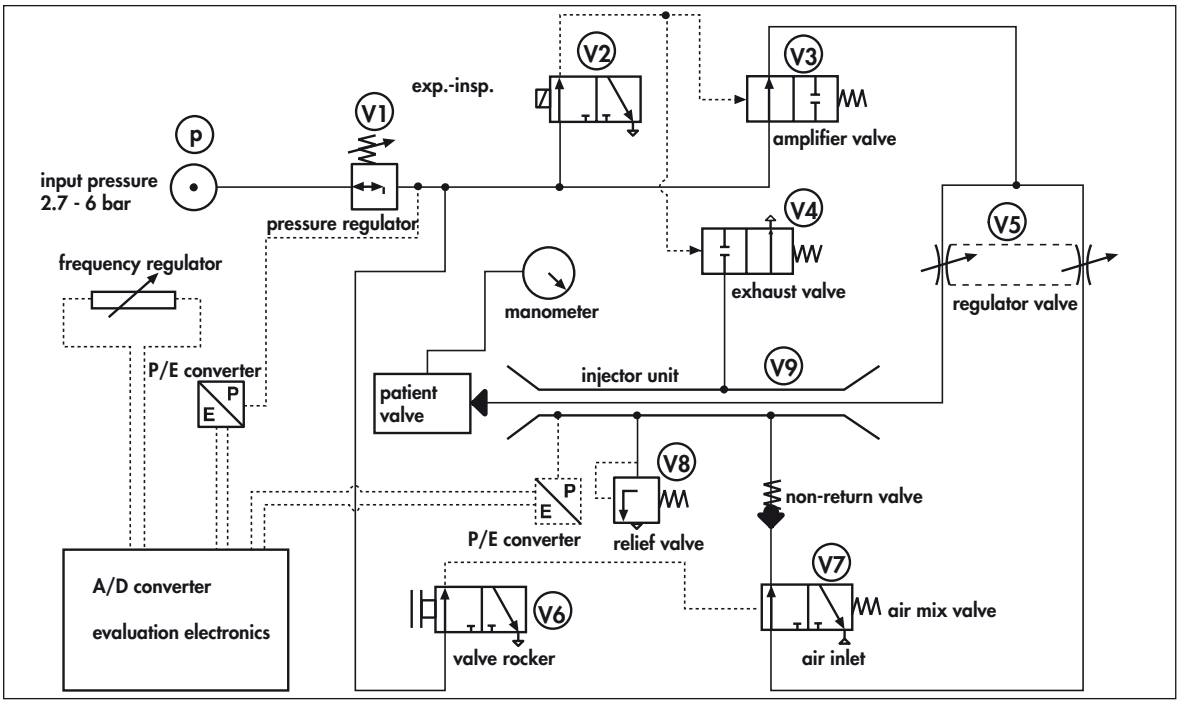
	MEDUMAT Basic / Basic p
Product category according to 93/42/EEC	II b
Device dimensions D x W x H	190 x 110 x 90 inc. connections
Weight incl. accessories	approx. 1.1 kg
Operating parameters – temperature range – humidity – air pressure	 -18 °C to +60 °C 15 % to 95 % 70 kPa to 110 kPa
Storage	-40 °C to +70 °C
Electromagnetic compatibility (EMC) in accordance with EN 60601-1-2 and EN 794-3: – interference suppression – interference immunity	 EN 55011 EN 61000-4-2 to 3
Control	Timing pulse, constant volume
Gas input	Medicinal oxygen
Operating pressure	2.7 to 6.0 bar
Minimal gas volume required	70 l/min O_2
Insp.-exp. ratio	1:1.67
Ventilation frequency	infinitely variable from 10 to 30 min^{-1}
Minute volume (MV) MV tolerances: – room temp. (20 °C) – -18 °C to +60 °C	infinitely variable 3 to 20 l/min for 3 l/min = ±20% for >3 l/min = ±15% for 3 l/min = ±35% for >3 l/min = ±20%
max. ventilation pressure – MEDUMAT Basic / Basic p Basic – MEDUMAT Basic / Basic p Basic p	 45 mbar 20 mbar or 45 mbar
O_2 concentration – Air Mix – No Air Mix	 see page 55 100% O_2

	MEDUMAT Basic / Basic p
High-pressure gas connection	External thread G 3/8
Connection to ventilation hose	External diameter 13 mm
Patient valve – inspiration tube	15 mm socket 22 mm plug ISO 5356-1
Patient valve – expiration tube	30 mm socket ISO 5356-1
Power supply life expectation max. storage:	maintenance-free lithium battery 3.6 V; 5.2 Ah > 2 years 10 years after delivery
Auxiliary energy for alarm system max. storage:	Button cell CR2430 10 years after delivery
F1 fuse	T 500 L 250V
Ventilation hose	Spiral silicone NW 10
Degree of protection against water	IPX 4
Standard complied with	EN 794–3; EN 60601–1; prEN 1789
Alarm sound pressure	54 dB A
Manometer accuracy	Class 1.6
Patient valve resistance (complied with EN 794-3): – Inspiration – expiration – spontaneous breathing	 <6 mbar at 60 l/min <6 mbar at 60 l/min <1.5 mbar at 30 l/min
Elasticity of breathing system	Negligible
Patient valve dead space	12.8 ml
Components dependent on the direction of flow	Patient valve
Parts containing latex	None

CE 0197

Subject to technical change without notice.

9.1 Pneumatics



The input pressure at **p** is max. 6 bar. This is reduced by **V1** to 2.7 bar dyn. This is the input pressure at **V6**, **V2** and **V3**.

Inspiration/No Air Mix

Valve rocker **V6** is opened and switches over **V7**. An electrical impulse to **V2** opens **V3** and closes **V4**. Oxygen flows through **V5** into injector unit **V9** and onwards to the patient valve. If the ventilation pressure in the patient valve rises above 100 mbar, the relief valve **V8** will open.

Inspiration/Air Mix

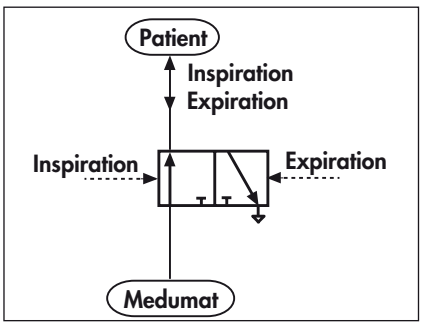
Valve rocker **V6** is closed. This closes **V7**. O_2 flows into injector unit **V9** through **V5** and sucks in air through **V7**. The air-oxygen mixture flows to the patient valve.

Expiration/Air Mix or No Air Mix

Another electrical impulse closes **V2**. Exhaust valve **V4** opens and exhausts injector unit **V9**. The patient breathes out through the patient valve.

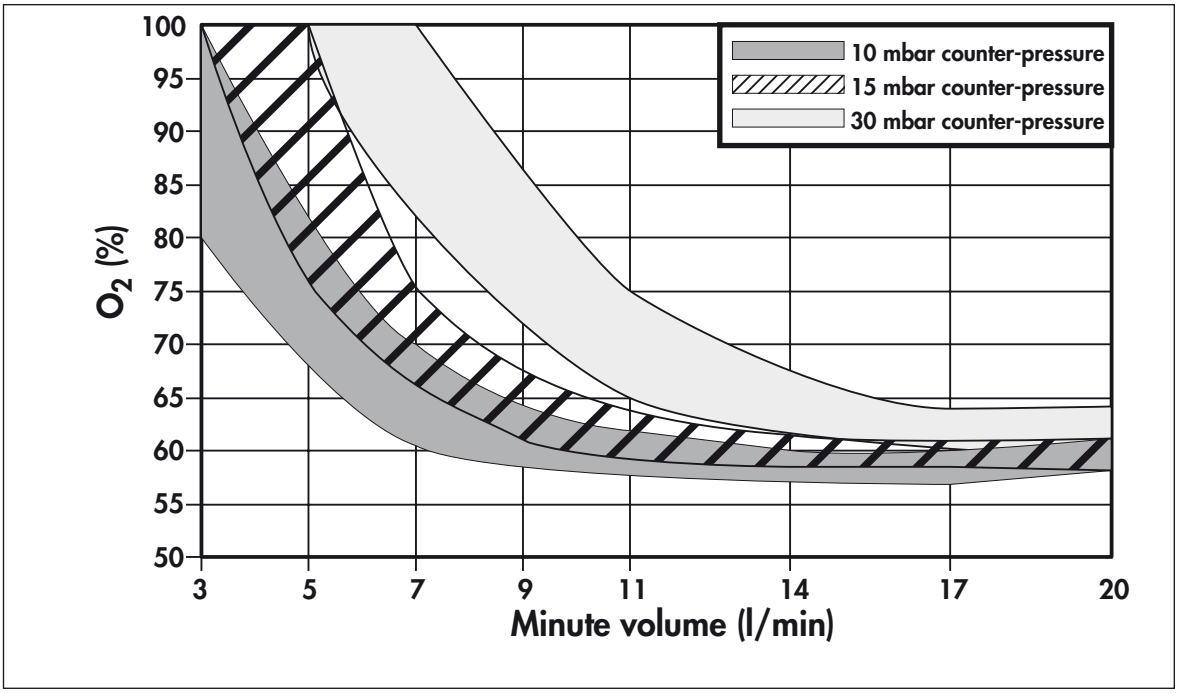
Patient valve

The respiratory gas flows into the patient's airways during inspiration. The expiratory pressure then switches the valve over and enables the patient to breathe out.



9.2 O_2 content when using Air Mix

The following diagram shows the oxygen concentration prevailing at various counter-pressures and minute volumes when **Air Mix** is switched on.



In isolated cases the minute volume (MV) deviations may be higher at ventilation pressures in excess of 30 mbar.

10. Technical Changes

Technical change	From Device No.	Date
Lid, white	1011 Basic	20.07.00
	1040 Basic p	28.01.99
Ventilation tube **45** rerouted and fitted with spring **54**. (see "6.20 Upgrading ventilation tube" on page 46)	1011 Basic	20.07.00
	1137 Basic p	6.07.00
Pressure controller spindle secured against vibration	1011 Basic	20.07.00
	1137 Basic p	6.07.00
Angled outlet	1020 Basic	21.07.03
	1400 Basic p	21.07.03
Software modification for cardiac massage and stenosis alarm	1014 Basic	03.12.03
	1400 Basic p	10.12.03
Housing parts, reinforced	1014 Basic	12.03.04
	1458 Basic p	12.03.04
Potientiometer cable, extended	1014 Basic	17.05.04
	1470 Basic p	17.05.04

11. Repair and inspection log

Inspection log – safety check in accordance with EEC - Directive WM 22671

Device: ☐ MEDUMAT Basic **Device-No.**: ..... **WM-Nr.**: 22600 **Date of manufacture**: .....
☐ MEDUMAT Basic p **Device-No.**: ..... **WM-Nr.**: 22650 **Date of manufacture**: .....

1. Test equipment
- Test pressure 6 ± 0.15 bar, pressure gauge 0 – 6.3 bar, class 1,6
- Volumetric flow measuring device RT 200; adjustable diaphragm 10 mbar; test set WM 15335
- Oxygen measuring device

2. Preparation for testing
- Connect MEDUMAT to the test unit.
- Set MEDUMAT to the "No Air Mix" setting at f = 30/min, MV = 3 l/min and p_{max} = 45 mbar.

3. Input the device data • Enter the above device data	**Measurement**	**OK**	**not OK**
4. Leak tests at 6 bar			
• Pressure drop, inlet side with lever set to "No Air Mix" ≤ 0.2 bar/min		☐	☐
• Pressure drop, inlet side with lever set to "Air Mix" ≤ 0.2 bar/min		☐	☐
• Pressure drop in pressure measuring segment ≤ 2.0 mbar/min		☐	☐
• Pressure reading deviation less than ±1.5 mbar		☐	☐
5. Self-test after switching on the device			
• All 4 LEDs are illuminated simultaneously and the alarm sounds		☐	☐
6. Functional check and alarms			
• With lever set to "Air Mix", Stenosis alarm is triggered		☐	☐
• With lever set to "No Air Mix", Stenosis alarm is triggered		☐	☐
• Alarm acknowledgement function		☐	☐
• Disconnection alarm is triggered		☐	☐
• Pressure alarm is triggered		☐	☐
7. Frequency check – frequency setting			
• Frequency 16 / min ± 2	☐ 1/min	☐	☐
• Frequency 10 / min ± 2	☐ 1/min	☐	☐
• Frequency 30 / min ± 2	☐ 1/min	☐	☐
8. Tidal volume check at 4.5 bar admission pressure and 10 mbar counterpressure	Air Mix / No Air Mix		
• f = 16 / min , MV = 20 l/min: AV = 1250 ± 190 ml	☐ / ☐ ml	☐	☐
• f = 10 / min , MV = 11 l/min: AV = 1100 ± 170 ml	☐ / ☐ ml	☐	☐
• f = 30 / min , MV = 3 l/min: AV = 100 ± 20 ml	☐ / ☐ ml	☐	☐
9. Check O_2 concentration at f = 10 / min and MV = 11 l/min			
• O_2 concentration with "No Air Mix" > 98 Vol.%		☐	☐
• O_2 concentration with "Air Mix"" > 50 – 65 Vol.%		☐	☐
10. Functional check – pressure limit with No Air Mix			
• Pressure limit responds at 20 ± 5 mbar (only MEDUMAT Basic p)	☐ mbar	☐	☐
• Pressure limit responds at 45 ± 5 mbar (MEDUMAT Basic and Basic p)	☐ mbar	☐	☐
11. Functional check – ventilation valve without patient valve			
• Test bag is inflated completely, respirator is then vented audibly.		☐	☐
12. Check the equipment and accessories (system components)	present / yes / no		
• Respiration tube with patient valve undamaged and fully functional	☐ / ☐	☐	☐
• Test set for functional check fully functional	☐ / ☐	☐	☐
• Pressure-reducer fully functional	☐ / ☐	☐	☐
• O_2 cylinder within the inspection limits; valve fully functional	☐ / ☐	☐	☐
• Support plate complete and fully functional	☐ / ☐	☐	☐
• Medcal products book	☐ / ☐	☐	☐
• Instructions for use	☐ / ☐	☐	☐
13. Check external condition			
• Zero setting of manometer		☐	☐
• Connection thread and knobs fully functional		☐	☐

Servicing carried out: yes ☐ no ☐ Final inspection carried out: _____ _____ _____
date inspector no. signature

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